IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication DECEMBER 22, 1960

The OUTLOOK For CAPITAL GOODS SPENDING

A Special Report on Metalworking Capital Appropriations p.39

Latrobe Steel's J. E. Workman:
A Look Ahead for Tool Steels p. 27

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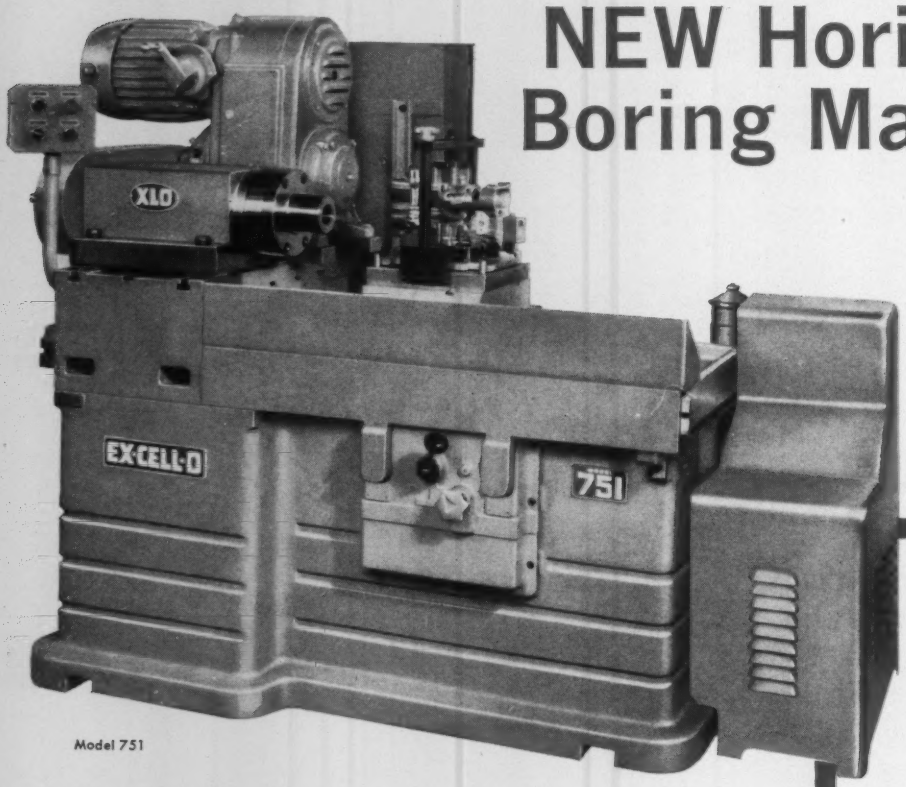
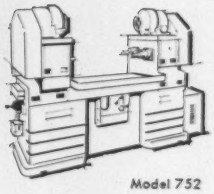
EX-CELL-O ANNOUNCES...

NEW Horizontal Boring Machines



Model 751



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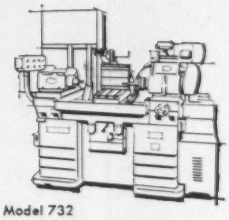

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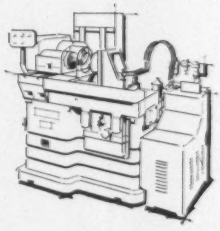

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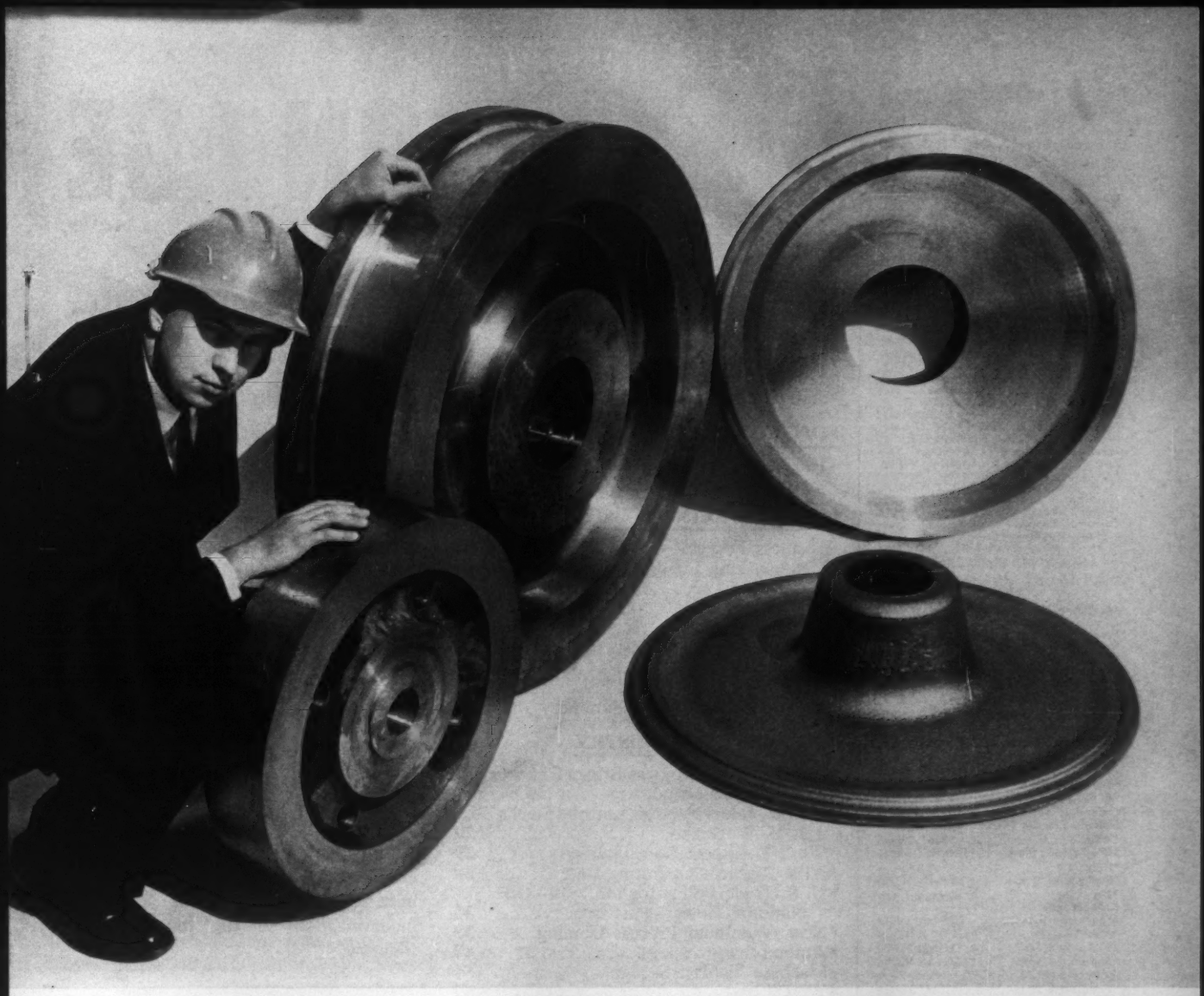

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The IRON AGE

December 22, 1960—Vol. 186, No. 25

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News of the Industry

TOOL STEEL INDUSTRY

A Look Ahead—J. E. Workman, president of Latrobe Steel, tells why depreciation changes are a must to

compete in world markets. He underscores necessity for rapid modernization in the tool steel industry. P. 27

GOLDBERG IN THE CABINET

What to Expect — Appointment of Arthur Goldberg as Secretary of Labor stirs speculation in industry. He will be pro-union, of course, but he's not an extremist and has much respect in and out of industry. P. 29

OPERATING RATE DIES

AISI Eliminates It—Starting in January the AISI will no longer report ingot production as a percent of steel's rated capacity. Instead it will substitute tonnage and index figures. P. 30

U. S. TRADE POLICY

Changing Patterns — The next ten years will see new and changing

Metalworking

The OUTLOOK For CAPITAL GOODS SPENDING

Cover Feature

CAPITAL SPENDING — Latest IRON AGE survey of metalworking's capital appropriations shows spending will fall steadily through first half '61. Third-quarter appropriations were 35 pct less than in third quarter '59. P. 39

patterns in world trade. The U. S. faces the problem of strengthening world ties while keeping domestic economy strong. P. 31

MANAGEMENT DECISIONS

They're Tougher Than Ever — Business problems are never easy to solve, but present ones are among the toughest. They include: Deciding when conditions will improve, the profit squeeze, and less interest among buyers for durable goods. P. 37

Engineering-Production Developments

GLASS-EXTRUDED STEEL

Influences Design — Steel extrusions are finding their way into many industrial applications where shapes are difficult to roll or where short production runs are called for. Present development work on the glass extrusion process is aimed at improving surfaces and giving more tolerance control. P. 59

MATERIALS HANDLING

Bigger Savings—A new power-and-free conveyor system is designed to get the most out of production. In operation at an auto assembly plant, the conveyor line is expected to pay for itself in less than three years. P. 62

CORROSION TESTING

A New Service—Valve and fitting failures are often mistakenly blamed on design or other mechanical factors. However, a new corrosion testing service corrects this costly fallacy. This new service fills an important gap by gathering data from actual valve sites. P. 64

QUALITY CONTROL

Start to Finish — A builder of core laminations puts out the effort to control each step of production from original design to the finished product. Every month this company turns out about 100 million pieces with a rejection rate of less than 0.5 pct. P. 66

AUTOMATIC SOLDERING

A Light Investment — Soldering can be economical if it's combined with automation. All the operator does is place the parts on the line. The rest is automatic. Production speeds jump by 25 pct. P. 68

Market and Price Trends

ALUMINUM

New Process—Industry attention is directed on Aluminium Ltd.'s pilot plant. It's a new process that could change the industry's structure if it's a complete success. But there are also questions. P. 33

AUTOMOTIVE

Customers Want Variety—Automakers say the public's appetite for variety is far from being filled. This demand by customers means more production problems. P. 49

WEST COAST

An Economic Lift?—Is there a cure for the nation's economy? Stanley H. Ruttenberg, AFL-CIO research director, says a 10-year building program could be the answer. P. 52

STEEL SUMMARY

Lowest in Years—Next week will see the lowest steel tonnage produced in any non-strike week since the late 1930's. But the January outlook is better, despite some auto cutbacks. P. 85

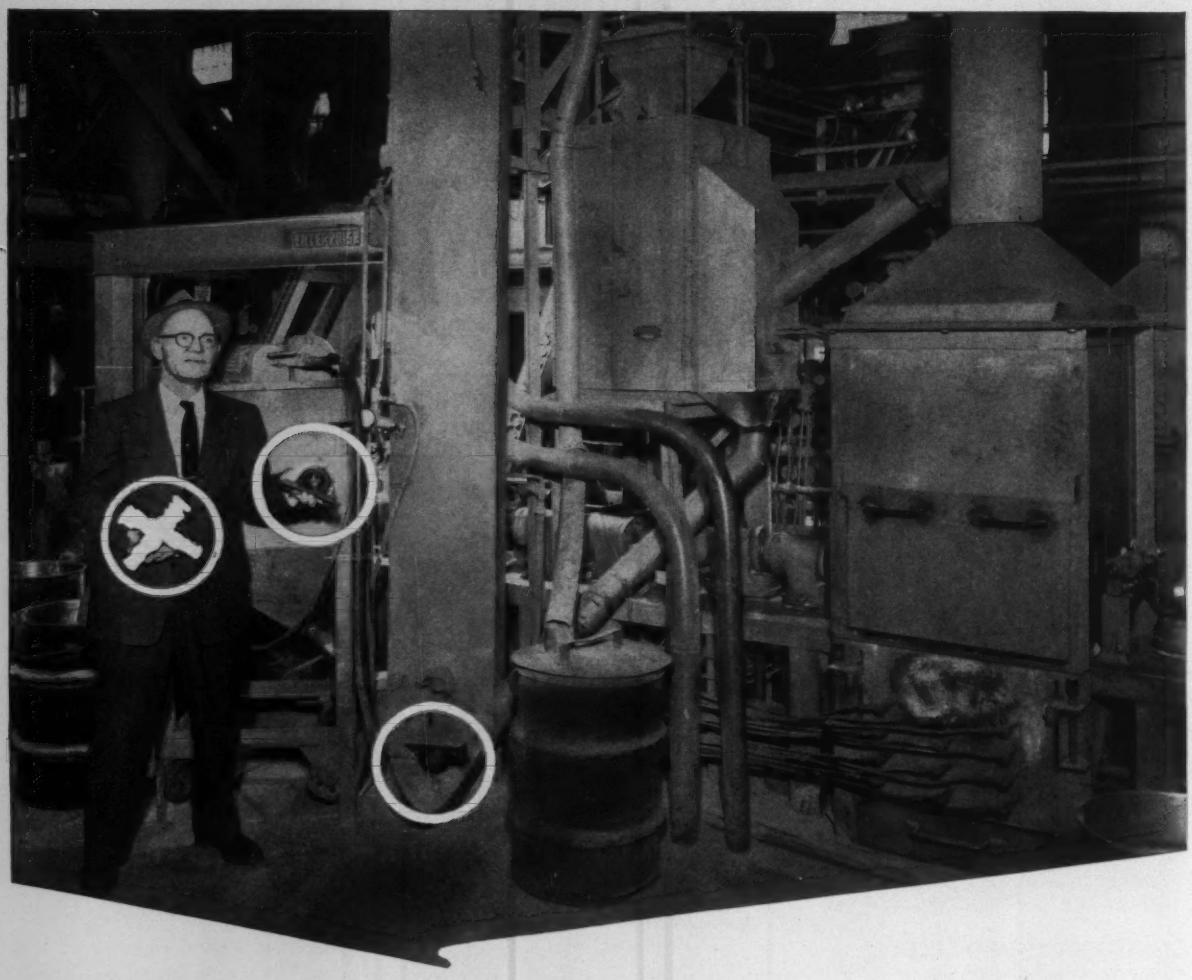
PURCHASING

Depressed Activity — The tool and die industry has suffered a lack of activity in the closing months of this year. And the outlook for 1961's first few months doesn't call for an upsurge. P. 86

NEXT WEEK

FRICTION WELDING

Competition—Russian engineers speak proudly of their progress in friction welding. It's now time for rebuttal. American Machine & Foundry Co. has built a friction welder. Next week's issue will feature a rundown on this new unit.



Bearings, Inc. recommended a better seal, a better bearing and savings are $700.00 a year!

Here's a maintenance foreman who knew where to get help when bearings in his care failed prematurely. He called a Bearings, Inc. engineer when the bearings in this bucket elevator conveyor failed after only two weeks of use.

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Steel Operating Rate: Much Ado About Something

The venerable, long-lived "percent-of-capacity" steel operating rate dies officially Jan. 1. Unofficially, it may come to life and, who knows, it may some day come back officially—again.

It was killed once before, but life was breathed into it because of demand from outside the industry. What is this thing which, among such problems as a steel recession, foreign competition, profit squeeze and a gold crisis, gets such attention?

The percent-of-capacity figure is the tonnage output divided by steel capacity on a weekly, monthly, quarterly, or yearly basis. It was not originally an American Iron & Steel Institute figure. At the turn of the century The IRON AGE carried a percentage-of-capacity figure. It was not until 1917 that the Institute decided to report a monthly figure patterned after The IRON AGE figure. And it was not until 1933 that the Institute started to release a weekly figure.

The percent-of-capacity figure is now said to be outdated and inaccurate—or to be incapable of reflecting correctly the true activity of the industry. Such an indictment could properly be made about practically all statistics in use today.

But what the industry does or does not do with its figures is its business. Why it took the present time—when actual tonnage figures are more than 14 pct below the average week of 13 years ago—to make the change is an enigma to many of its own people.

The figures which will supplant the old steel rate will be quite sterile from a statistical standpoint. Missing will be weekly forecasts which were held in great esteem by newspapers, economists, businessmen, steel customers, and steel suppliers. The move by the industry will, of course, kill off a steel statistical series which probably is one of the oldest and most revered in the business community.

It can not be revived unless the Institute—sometime in the future—restores for public use company and industry capacity figures. It is almost inconceivable that this will not be done after sober judgment and thought, free of emotional impact and possible hostility to some sections of the press.

Even so, there are too many other pressing problems in the world to tarry long over the dropping—officially—of the steel ingot operating rate by the Institute.

Tom Campbell

Editor-in-Chief

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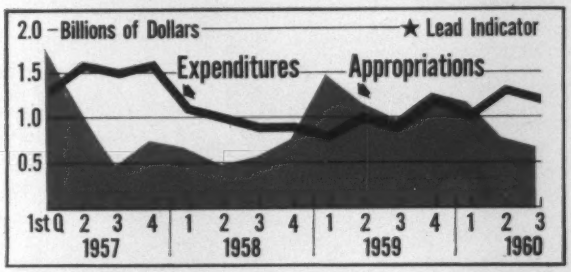
First Half Drop in Capital Spending

Capital goods spending by metalworking companies will continue downward at least until June. But plant



and equipment expenditures are not expected to drop to 1958 recession levels.

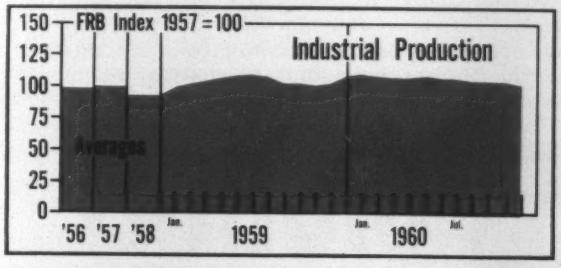
The IRON AGE's survey of third quarter capital appropriations (see p. 39) shows metalworking companies set aside 35 pct less money for capital goods than they did in third-quarter '59. From the second to third quarter of this year new spending plans were cut 22 pct.

Factory Payrolls Dip—Again

A leveling of personal income, after a series of eight consecutive months of new records, reflects the drop in factory payrolls. The income level of $409.5 billion (seasonally adjusted annual rate) was maintained in spite of a decline in factory payrolls. They dropped off $700 million, down to an annual rate of $65 billion. It was the sixth consecutive drop in factory income in spite of the overall series of gains.

Down in December; Up in January

The two-point decline in the Federal Reserve Board's Index of Industrial Production in November (from 107 to 105) is likely to be repeated this month. Automotive



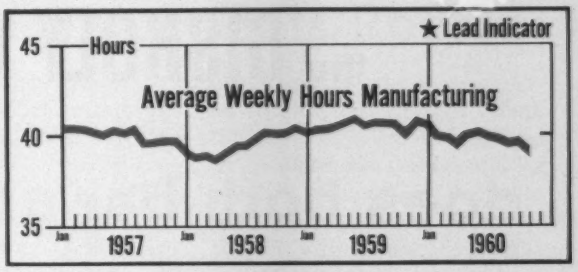
assemblies, output of consumer durables, all of which dropped in November, are continuing to slow this month. The same applies for primary metals. However, January shapes up as a better month, at least on the basis of present industry sentiment. Another point which will make December look bad: Many industries will close for several days for the holidays.

Will Ford Do Own Galvanizing?

Ford Motor Co. is in the "paper work" stage on a new continuous galvanizing line at its Dearborn steel plant. It's said to be a $5 million project. Ford, for the record, has pushed the use of galvanized on its Falcon and Comet cars. Over the past years, the Ford mill has produced roughly half of the company's steel, although not all types.

Workweek Drops Through December

The average factory workweek generally holds level in November. But last month a slight gain in October was more than wiped out as weekly hours in production dropped from 39.4 (revised) to 39.1. The



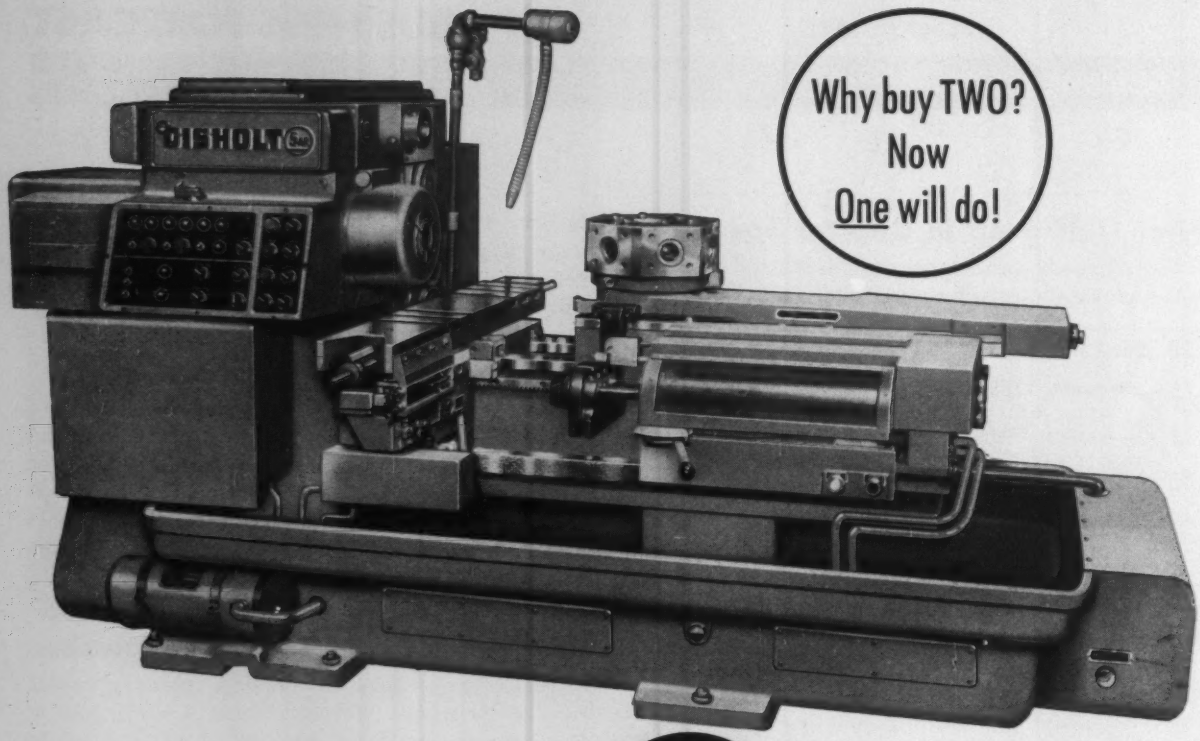
October gains were attributed to increased auto production. But the November decline was comparatively general. Outlook for this lead indicator: Another drop in December.

Price Stability Here for Some Time

Businessmen who follow the axiom that because wages and other costs are up, prices have to go up, may be in for a major surprise. The long-term outlook for prices now indicates a period of stability. Some examples: Declines in recent price drops in nonferrous metals.

If this follows through, the profit squeeze will stay on until the advantages of new equipment, more aggressive selling, new products in good volume, become more than a talking point. These will be needed to overcome the deflationary factor of over-capacity —working in combination with consumer pressure.

But for the immediate future, there is little in sight to foster hopes of price relief.



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How Pro-Union Will New Secretary Be?

Will organized labor have a seat in the Cabinet now that Arthur Goldberg is slated to be Secretary of Labor?

To some extent, it's inevitable. And, of course, it's the Secretary of Labor's job to push for the welfare of all labor, both organized and unorganized.

But people who expect Mr. Goldberg to be primarily an advocate for the United Steelworkers are likely to be surprised. First, those who know the general counsel for the USW know he will do the job the President wants done.

His former foe at the bargaining table, R. Conrad Cooper, U. S. Steel executive vice president has this to say: "Mr. Goldberg's appointment provides a very able man with the opportunity to perform an important public service."

Then, there's an intangible: Many people who have followed a unilateral course in private life have changed their viewpoints when called to Washington. It happens with every Administration.

Kennedy Is Pledged To Fight Picket Ban

President - elect Kennedy has pledged to "lead the fight" for relaxing restrictions on picketing, the AFL-CIO craft unions say. Union leaders are drafting a legislative program for next year. They say the new President has agreed to push hard for softening present picketing restrictions.

Union Can't Restrict Speed of Machinery

Production speedups cause a lot of wildcat strikes. And unions usually demand more workers be put on the job, or that pay rates be raised, or both. But a printing-trades ruling might clear up some of the obligations involved.

Pay rates don't have to be adjusted whenever job content is increased or decreased where work is paid by the hour, rather than by piece-work or incentive. That's the substance of a ruling handed down by a New York arbitration board.

The New York NEWS boosted speed of its printing presses to 60,000 papers per hour from 50,000. Union argued that current wage rates and manning tables were premised on the lower speed; that the higher rate constituted a change of job content not permissible under the existing contract.

The board pointed out that as long as incentives or piece rates weren't involved, wage adjustments weren't in order. And that the contract provides "the union also guarantees at all times a full and satisfactory production from such machinery and material."

Expert testimony indicated the higher speed did not constitute a safety hazard. But the board cautioned employers they can't demand a production rate that will cause "undue physical burden" on the workers.

Unemployment Sets Record

Despite record employment for the month, November unemployment climbed to its highest total since WWII.

Unemployment rose by 450,000 during the month ending in mid-November to 4,031,000. At the same time, the number of jobholders fell by 300,000 to 67,182,000. However, employment still set a record for the month.

The monthly report shows mostly seasonal changes except in manufacturing employment which fell by 150,000, "twice the average amount for this month," according to the Bureau of Labor Statistics.

Seasonally adjusted, the jobless rate dipped slightly to 6.3 pct from 6.4 pct in mid-October. But it is still the second highest rate for the period since WWII. And, more significantly, it marks the second consecutive month in which the rate exceeded 6 pct of the work force.

Another disquieting feature: Long-term (15 wks or more) unemployment rose sharply. About 488,000 had been unemployed for 15 to 26 wks. Another 499,000 had been jobless for more than 26 wks. The total was about 200,000 higher than a year ago, and higher than any postwar November except 1958.

Long-term unemployment accounted for one out of four jobless persons last month. Short-term unemployed (less than 5 wks) made up 45 pct of the total, down from 50 pct a year ago.

Dr. Seymour Wolfbein, Dept. of Labor manpower chief warns joblessness will probably increase in the months ahead.

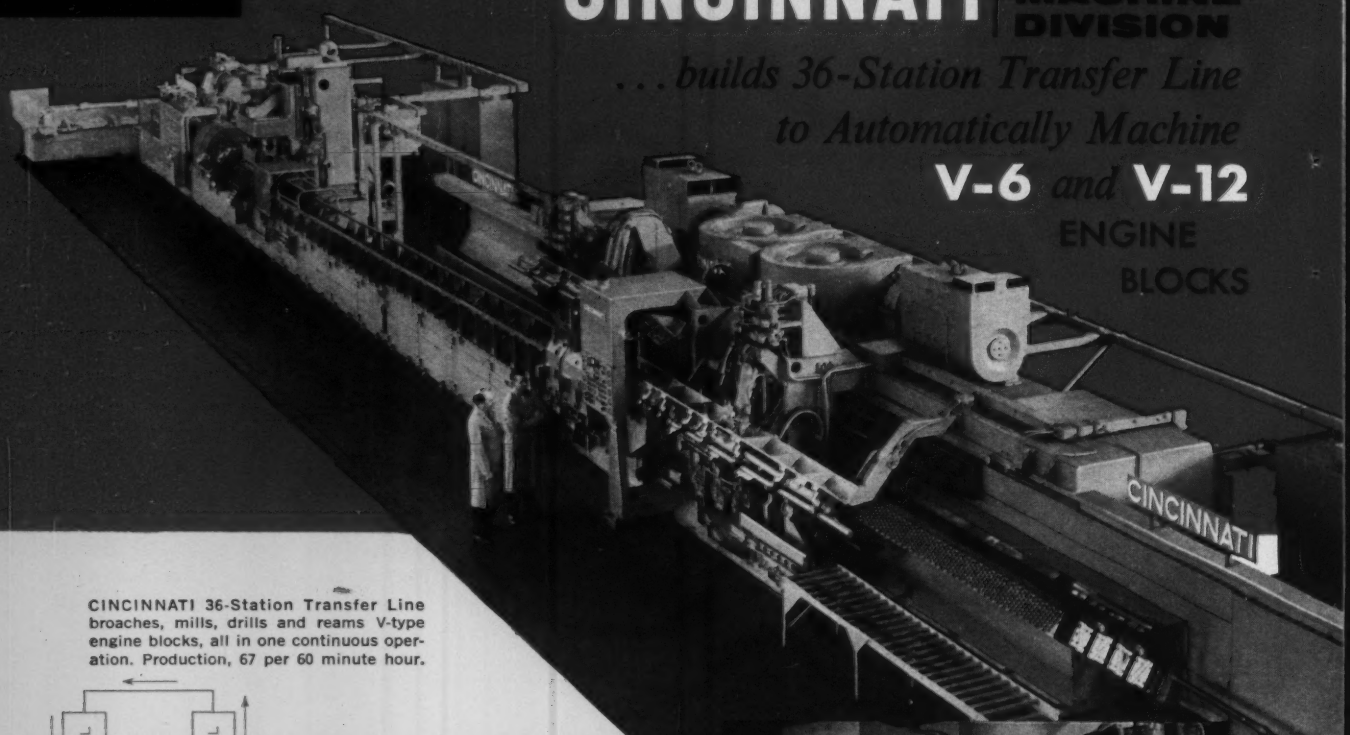
At the present rate, it will go up to 4.2 million in December, 5.2 million in January, and 5.3 million in February. And, he adds, unless there is spring upturn in the economy, the number of jobless **"could come close to 6 million by May and certainly by June."**

CINCINNATI

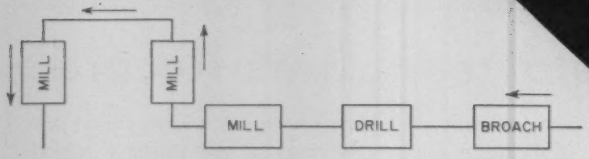
CINCINNATI | SPECIAL MACHINE DIVISION

. . . builds 36-Station Transfer Line to Automatically Machine

V-6 *and* V-12 ENGINE BLOCKS



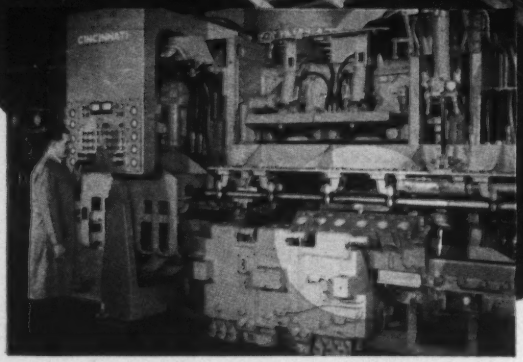
CINCINNATI 36-Station Transfer Line broaches, mills, drills and reams V-type engine blocks, all in one continuous operation. Production, 67 per 60 minute hour.



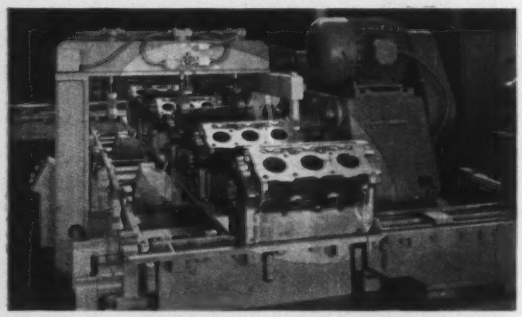
In this CINCINNATI special 36-station transfer line, the world's largest broaching machine is integrated with drilling and milling stations . . . for continuous, automatic machining of automotive engine blocks. Both V-6 and V-12 blocks, made in three different bore sizes, are accommodated with very little change-over. Cincinnati's Special Machine Division designed, built and assumed full responsibility for every detail of the line.

Twelve surfaces are machined on the broach, which has a 600 hp drive capable of developing a broaching force of 100 tons! Manufacturing holes then are drilled and reamed, and 10 surfaces milled, all in one continuous automatic operation. The line measures approximately 140 feet, and contains 30 motors rated at more than 1000 hp.

From the first broaching operation to the final interlock station, this giant production line is evidence of the capabilities of the Special Machine Division. Our Field Engineers will be glad to give you an analysis of what they can do for you. **Special Machine Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.**



BROACHING STATION. As blocks move through the line, the top, bank faces, pan rail, bearing pads, bearing locks and half bore are broached.



MILLING STATION. Pads are milled on the side of the block, and the front and rear ends are rough and finish milled.

SPECIAL MACHINES • COMPLETE PRODUCTION LINES
• VERTICAL AND HORIZONTAL BROACHING MACHINES

CINCINNATI®
SPECIAL MACHINE DIVISION

★ Defense: Saving or Spending?

Something seems to be wrong with Sen. Stuart Symington's figuring on defense spending. Using Mr. Symington's figures, the next U. S. defense budget could go as high as $49 billion.

The Senator, who backs a money-saving reorganization of the Defense

SYMINGTON: Sleight of Hand?

Dept., says the U. S. will have to boost military spending above the present $41 billion even if the reorganization plan is approved.

He headed a group which submitted a plan for drastic changes in the defense setup to President-elect Kennedy. He claims the plan could save the U. S. $8 billion.

Where does that leave defense spending? Predictions in Washington have varied from no increase to a $5 billion jump for next year. Defense Secretary Thomas S. Gates, Jr., is proposing only a slight increase in present spending.

Sen. Symington concedes the $8 billion "saving" through a Pentagon overhaul would be eaten up in a variety of new outlays. Factors that would offset savings:

Making American's "nuclear-space age" defenses adequate; rising costs of new weapons; rapid changes in technology; expense of administering and policing any arms control program that the world might enter into; and the fact that the nation should have more combat soldiers, with better equipment and an expanded air-lift capability to move them.

If the offsetting factors become reality, the spending picture is complicated all the more.

For, if Congress does not approve defense reorganization, the $8 billion savings might become $8 billion in spending.

■ Steel Study Expected

Labor Secretary James Mitchell will release his long-awaited study of the basic steel industry only a day or two before he leaves office. He will receive it about Jan. 16.

The report is now being put into final shape. A first draft has been circulated among industry and union leaders. Extensive revision, taking into account their objections, is underway.

The study dissects government, labor, and management participation in steel industry disputes. It is expected to be more to the liking of industry than labor or government.

■ Slowdown Is Ahead For Road Program

A sharp slowdown in the federal highway program is in sight after mid-1963 unless Congress provides new revenue, federal highway officials now say.

Bertram D. Tallemy, Federal Highway Administrator, says the trust fund will fall about $700 million below the $3.2 billion a year needed if the interstate and ABC network is to be completed in 1972 as scheduled. Without new funds, the program won't be ready until 1976, he adds.

■ Congress to Hold Automation Hearings

Union-backed moves to counteract layoffs caused by automation will get an airing in the 87th Congress. Among them will be actions sought by USW president David J. McDonald.

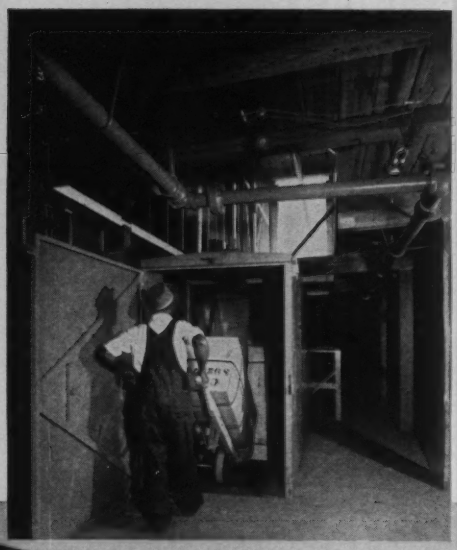
In a report to Congressmen, Mr. McDonald lists certain measures he considers necessary to counteract unemployment caused by automation. Many of these are supported by President-elect Kennedy.

■ Propose One Manager For Defense Production

Federal watchdogs suggest that the far-flung production equipment control offices of the Army, Navy and Air Force be consolidated. In a report, yet to be made public, the General Accounting Office, recommends that production equipment facilities operated by the Defense Department be put under the guidance of a single manager.

The single manager idea, if feasible, would coordinate defense equipment planning. For industry, it could mean better communications with the government on equipment programs. Accounting officials say such a centralized agency would save the government several hundred million dollars.

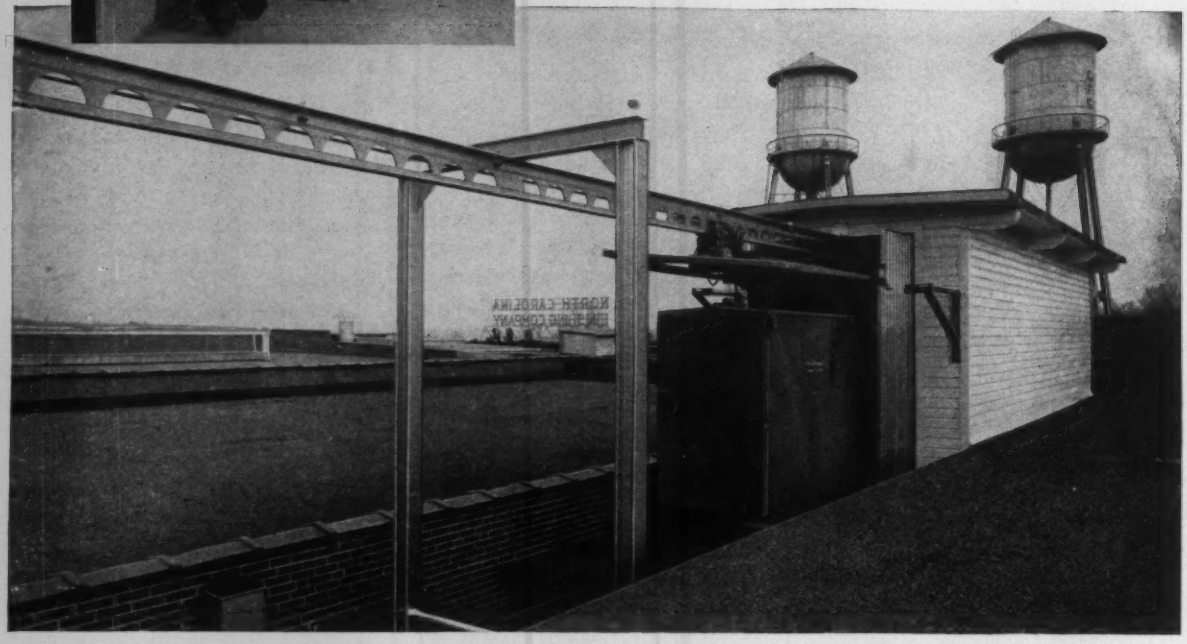
The report now is being studied at the Pentagon.



Uses Skyway For Handling Materials AUTOMATICALLY

Completely Pays for Itself Every Three Years

Loading a van on the second floor of a building. This same van also may be lowered to the floor below for loading. Although the building at this end of the system is quite old, the Cleveland Tramrail equipment was easily installed. For years this vast roof area did nothing more than provide protection from the weather. Now it is being used profitably for materials handling. Illustrated is the van emerging from the penthouse.



BY erecting a Cleveland Tramrail materials handling system over the roofs of its buildings, a large plant is able to transport materials between departments located in widely separated buildings at very low cost.

Because the system operates automatically, the Tramrail carrier travels back and forth without any operator. The carrier van is loaded or unloaded at convenient areas inside the buildings. Pressing a button sends it on its way. It rises vertically to a penthouse on the roof. Then it makes its run over the track system to the penthouse at the other end. Here it lowers to the floor inside for loading or unloading.

The system eliminates considerable floor traffic and saves space required for wide aisleways. It operates at any time, day or night. Inclement weather does not hinder it. The system requires only a fraction of the maintenance necessary for floor handling equipment. It does not wear or damage floors. It is a big aid to safety. In addition to these important benefits, the Cleveland Tramrail system makes tremendous time savings — enough to completely pay for the entire installation every three years.

Cleveland Tramrail has had wide experience in automatic dispatch materials handling systems of many types. Our engineers will welcome an opportunity to work with you.

CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO • 4819 E. 290 ST. • WICKLIFFE, OHIO

Romney Lashes Out At Ford, GM Expansions

George Romney, president of American Motors Corp., has charged that General Motors Corp. and the Ford Motor Co. are "running away" from America by expanding their overseas interests.

Mr. Romney claims investment of American capital abroad is more than what is needed to serve foreign markets. He contends Ford and GM are setting up world networks to permit them to secure parts and supplies from the standpoint of sheer cold economics.

He says this is what Ford's small-car Cardinal program is all about, as well as its move to gain complete control of Ford of England. And the pattern isn't limited to the auto industry, according to Mr. Romney.

"Others have made foreign facilities the principal source of parts for the U. S. market."

He believes, "It represents economic imperialism and is a move to become exempt from national policies and boundaries." Aiming directly at Ford and GM, he charges, "You can't help America by running away from it."

(American Motor's Metropolitan, by the way, is made for the U. S. auto company by a leading English automaker, then imported to this country.)

Will Kennedy Be Able To Raise Tariffs?

Higher tariffs on some imports may get legislative and administrative backing soon. Presidential and Congressional action in 1961 is geared toward a reappraisal of U. S. tariffs.

The U. S. Supreme Court inadvertently aided such action recently by refusing to review a decision limiting the President's power in "escape clause" cases. The court let stand a ruling requiring the President to accept or reject, but not change, Tariff Commission recommendations to assist U. S. industries in "escaping" harm from imports.

President-elect Kennedy leans toward some tariff increases. The high court decision makes it harder for the President to change tariffs. Therefore, legislation to reverse the court's action—may be in the offing.

Senate Republican leader Everett Dirksen says Congress will "reappraise" American tariff policies in the coming session. The machine tool and lead and zinc industries have been mentioned specifically for tariff changes.

Latins Will Find U. S. Funds Tight

It will take more money than the U. S. is prepared to give before Latin America can get back on its feet financially. At least that's the way the situation is shaping up.

Venezuela, for example, recently mentioned a $1 billion figure as necessary for economic rehabilitation. This is more than the U. S. has planned for all Latin America.

South American sources informed The IRON AGE as long ago as last September that it would need between $6 and $10 billion as a start.

But these are tough times when it comes to raising American dollars. With the Kennedy Administration under pressure to keep dollars at home, and a general increase in sentiment against foreign aid, it's probable that Latin America will find itself on the short end.

Instead, the U. S. will probably encourage these nations to tap their own upper classes. They, in all probability, are in a position to do what the U. S. is being asked to do.

European Wages Still Draw U. S. Companies

There are many reasons why American industries are moving production facilities overseas. But high on any list of reasons is lower labor cost.

In Europe, the pattern of wages has experienced many changes in the past decade. In most cases, wages have risen, but so has the

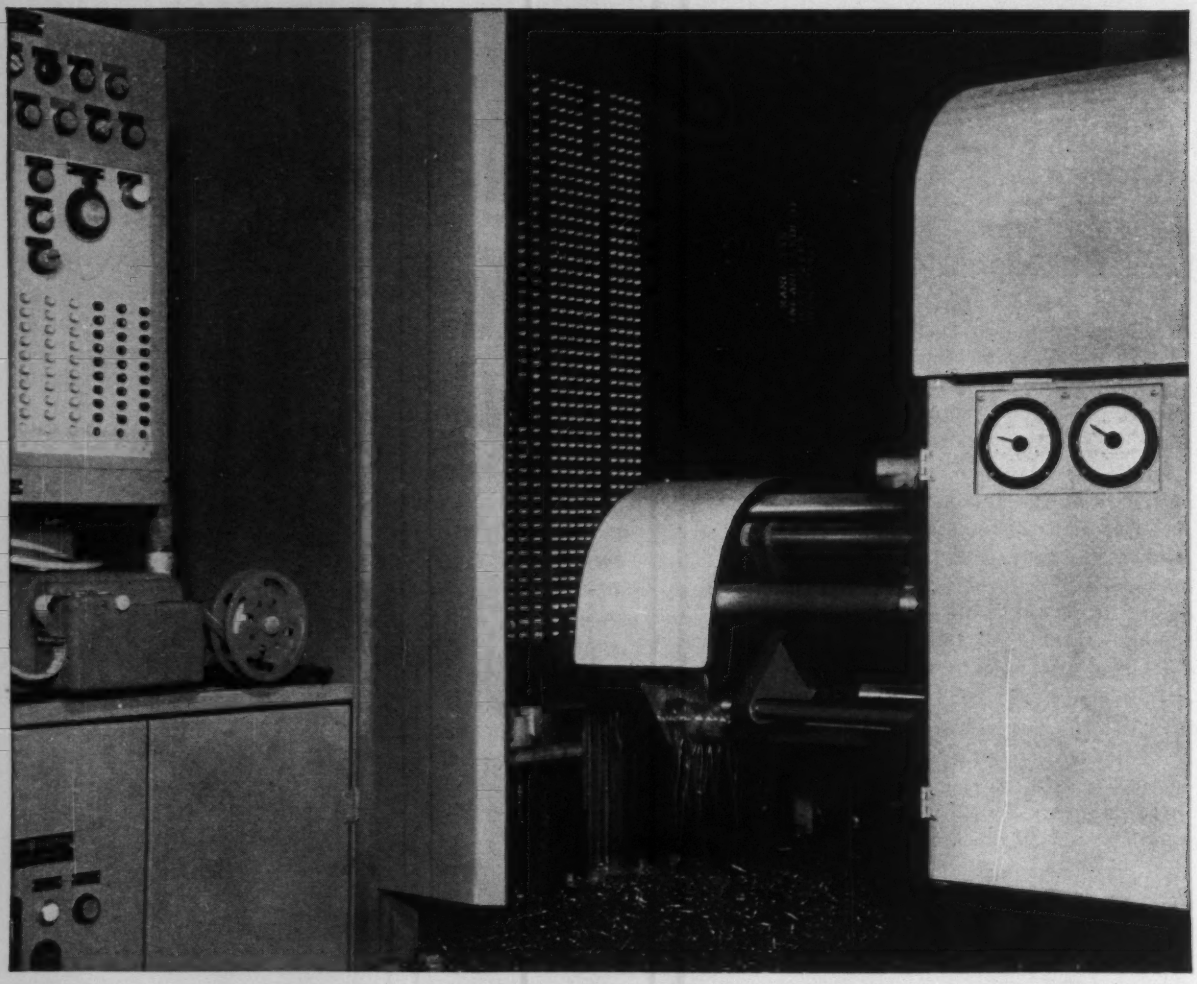
cost of living. In France, for example, workers now earn better than 140 pct more than they received in 1949. Germany's wages are up 91 pct; England's workers get 77 pct more.

The U. S. worker, on the other hand, has noted an increase in pay of 51 pct from 1949.

New Economic Alliance

To solidify the free world against the growing trade challenge of communist countries, the U. S., Canada, and 18 European nations have formed a new economic organization.

The international body will be known as The Organization for Economic Cooperation and Development. The move brings countries outside of NATO into an overall economic alliance. These countries are Austria, Ireland, Spain, Sweden and Switzerland.



"40 IPM AT *875 rpm*... WE WERE AMAZED"/ *says Walter P. Hill*

DATA:	1020 LEDLOY LEADED PLATE 1½" THICK	1020 NON-LEADED PLATE 1½" THICK
PENETRATION RATE Production Run	40 IPM	20 IPM
DRILL SPEED Production Run	875 RPM	750 RPM
MAXIMUM IPM Test Run	up to 47	up to 28
CHIP CHARACTERISTICS Thickness Temperature Type	.060—.080 cool broken	.040—.060 cool curled

"Ours is a specially designed numerically controlled jig drilling machine with which we obtained penetration rates of 20 Inches Per Minute at 750 RPM in standard half-inch thick 1020 steel plate. However, with the same set-up, we easily obtained 40 IPM at 875 RPM in INLAND LEDLOY leaded steel plate three times as thick and with far better tool life.

■ "Actually, in LEDLOY, we reached penetration rates of 46 and 47 IPM but consider the 40 IPM more practical for production runs. Our programmed test run was made on steady plates for large condensors in which 1½" LEDLOY steel plates were used. As a control, equivalent drillings were made in non-leaded plates of the same chemistry and the same thickness. Our load meter showed the same pulled load on LEDLOY at 40 IPM as we pulled on the non-leaded plate at 20 IPM. Tool life using LEDLOY plates at 40 IPM was equal to tool life using non-leaded plates at only 20 IPM.

■ "We conclude, and without hesitation state, that LEDLOY displayed a marked improvement."

Walter P. Hill, President
WALTER P. HILL, INC.
DESIGNERS AND BUILDERS
SPECIAL AUTOMATED MACHINES
DETROIT, MICHIGAN

LEDLOY®
the world's most machinable steels

INLAND STEEL COMPANY
30 West Monroe Street, Chicago 3, Illinois

Aids Metallurgical Studies

With an 8-in. diam vacuum chamber that's 10 in. high, a versatile vacuum-arc furnace serves for button melting or for making small ingots. This furnace is adaptable to either consumable- or nonconsumable-electrode cold-mold methods. The basic unit can melt and refine up to eight 1½-in. diam by 1-in. thick buttons of titanium, zirconium or uranium. A 6-in. charging port permits button changing without removing the mold.

Heat Treat Structures

Heat treating of steel structures is now being tested by a structural fabricator. Large I-beams and channels are being hardened in this program. The fabricator believes that success is just around the corner. Current problems include the limitations of furnace capacities and the prevention of distortion during heat treatment.

Big Welding Economies

The Russians attribute a savings of 100 million rubles to electroslag welding in the construction of two Soviet boiler-drum works. The Chinese note similar savings from the same process. The Soviet Union reports that some builders are using electroslag welding to erect blast-furnace blocks and large cement plants.

Flow Turns Huge Cylinders

One of the largest horizontal shear-forming machines ever built will soon find its place on the production floor. This machine cold-extrudes both cylindrical- and conical-shaped parts up to 70 in. in diameter. With dual rollers, the machine back-flows cylinders up to a length of more than 140 in. In a single pass, it can reduce blank thicknesses by as much as 50 pct.

Repair Radioactive Tools

How do you repair costly equipment that's radioactive? Until now such repairs haven't been possible. Today, because of a large-scale decontamination project, backed by the AEC, costly nuclear hardware is being scoured of radioactive "grime". After repair, this equipment returns to atomic-production lines. Before decontamination got underway, lots of high-cost equipment had to be buried in underground pits.

Cast With Hollow Sprue

Successfully violating accepted foundry practice is a hollow sprue. Instead of a wide-open passageway, it's a thin-walled cylinder through which molten metal flows to reach mold cavities. The developer of the new sprue, Precision Metalsmiths, Inc., Cleveland, reports that it leads to lower production costs while improving the properties of shell-molded castings.

New Deep-Drawing Steel

A breakthrough in improving ingot yields and the quality of deep-drawing steels may be very near. One major sheet producer has been testing the new method — which involves rare earths — for many months. At least three other producers are also reported to be experimenting with it.

Harder High-Speed Steel

Increased use of high-temperature alloys and other hard-to-machine metals has created a wide demand for more economic tooling. One company claims to have the answer. It centers on a new high-speed double-tempered steel. With a hardness of 70 Rc, the newcomer is the hardest grade of high-speed steel perfected to date. The alloy contains 1.15 pct C for extra toughness.

Prevent Hot Cracks

In alloy ingots of the Nimonic-type, the peripheral zone has a coarse columnar structure with sharply expressed anisotropy of plastic properties. This structure isn't always entirely eliminated by preforging. Remnants of columnar grains are often found in forged billets. In hot-forming operations, such as upsetting, these remnants promote cracking. Therefore, Nimonic alloys should be hot-worked in a narrow heat range.

DEMAG

Cost-conscious Engineering

This eight-strand continuous casting plant* for producing standard steels has been in full operation at the Terni steelworks in Italy since 1958. A plant built for S.A.F.E. Hagondange in France is a fine example of such an installation for continuous casting of alloyed steels. Further plants for the production of concast billets and slabs are being planned for foreign and domestic customers.

*designed and built by DEMAG according to the Junghans system in co-operation with Mannesmann AG and Gebrüder Böhler & Co

DEMAG AKTIENGESELLSCHAFT DUISBURG GERMANY

US-Representatives: American DEMAG Corporation, One Gateway Center, Pittsburgh 22, Pa

LETTERS FROM READERS

Editorial Praise

Sir—We have read, in the past, many fine industrial and public service articles in your magazine, but would like to express our particular appreciation for your recent series on current affairs and the election. Its spirit of helpfulness and constructive thinking was evident on every page—and this is a worthwhile accomplishment in these days. It is certainly within the scope of all editors to influence their readers; but not all have the talent to handle this responsibility with intelligence, forthrightness and insight. When they do, their readers have much to be grateful for.—Martin B. Gordon, Tubular Structures Corp. of America, Los Angeles, Calif.

Sir—I think you really hit the nail on the head with your editorial in the Nov. 17 issue of The IRON AGE (The Significance? The People Are Divided"). These are cold, hard facts. However, I think they should be brought to the attention of all of us repeatedly.—Roy C. Hobson, vice president and general manager, National Malleable and Steel Castings Co., Cleveland, O.

Timely Comments

Sir—Your editorial, "Fighting Communism: Why Is It So Difficult?" was especially appreciated. For many years I have enjoyed your timely comments and take this opportunity to express my thanks to you. When you brought out the point that it will take all of the spiritual help God can give us to stand up against Communism, I could not help but express my appreciation to you. For it is our trust in God that will help America stand up against Communism to be sure. —Herb Nelson, International Harvester Co., Chicago, Ill.

Incentive Plans

Sir—I read with interest the article in the Nov. 3 issue of The IRON AGE on "How Foremen's Incentive Plans Help Cut Productive Costs," by J. R. Walley.

I will not comment on the advisability of incentive plans for foremen. I feel, however, that I should comment on the statement made on p. 85, "As the use of incentive pay plans increases . . ." There is absolutely no indication that pay plans are in fact on the increase. The truth is that any and all objective surveys in the past ten years show incentive plans on the decrease or remaining constant.

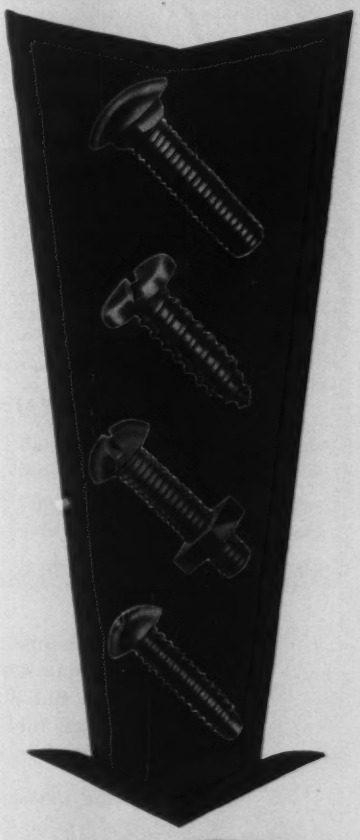
The most recent survey of any consequence was conducted by the Bureau of Labor Statistics on the "Extent of Incentive Pay in Manufacturing." This study showed that approximately 27 pct of 11.25 million production and related workers in manufacturing industries were paid on an incentive basis.

A BLS survey about 12 years earlier showed approximately 30 pct of manufacturing workers on incentives. The two figures are not exactly comparable due to some differences in the industries surveyed. However, even if this figure had remained the same a decrease in the number of workers actually on incentives would have occurred due to the decrease in the number of workers generally.

If foremen's earnings have not kept pace with those of their subordinates, I suggest that the reason might lie in the fact that the subordinates are organized and not that they are paid on the basis of incentives. It seems to me that the implication for foremen is clear.—Bertram Gottlieb, American Federation of Labor and Congress of Industrial Organizations.

■ **What Mr. Walley said was, "With the widespread increase in incentive pay plans, the range between a foreman's earnings and that of his subordinates narrowed."—Ed.**

YOUR BEST SOURCE FOR STANDARD FASTENERS



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Southern's 15-year experience in the exclusive manufacture of screws is responsible for its reputation as a supplier of the finest USA-made standard fasteners available.

Southern fasteners are sold through leading distributors located throughout the nation. These sources are supplied from Southern's amply stocked warehouses or from our stock of over 1,500,000,000 fasteners at the factory and main warehouse in Statesville, N. C.

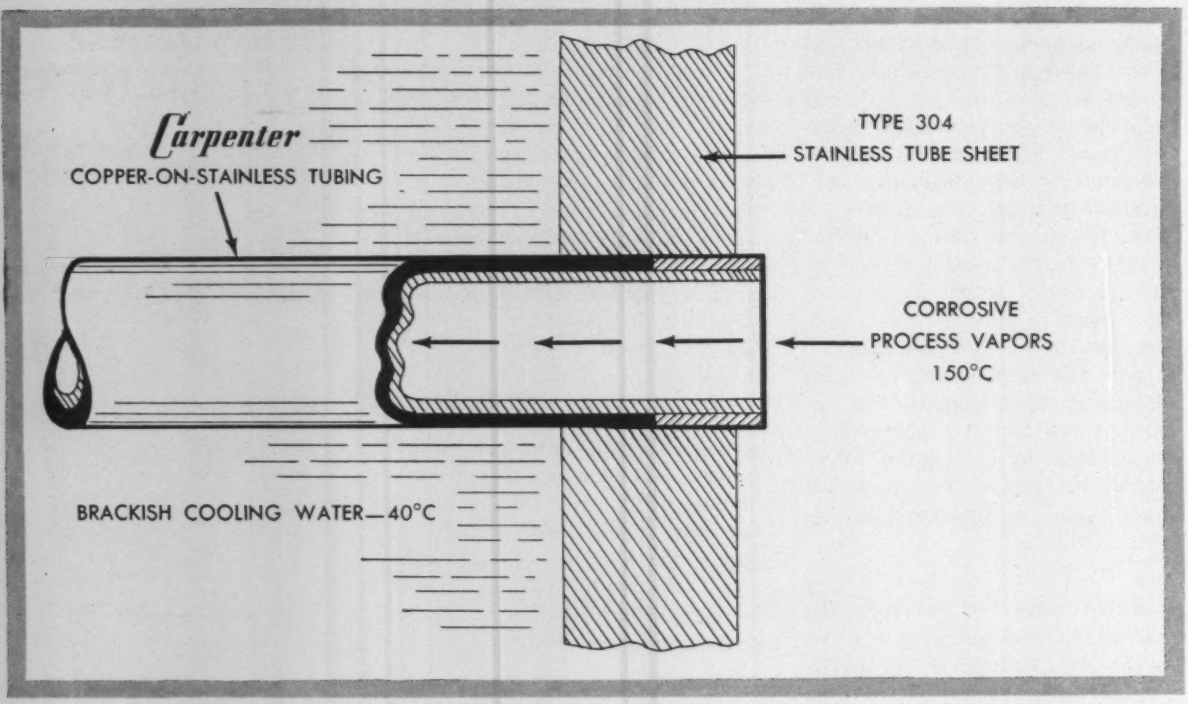
Let Southern's Stock List guide you in the selection of standard items immediately available from stock. Write on your company letterhead to: Southern Screw Company, P. O. Box 1360, Statesville, North Carolina.

Machine Screws & Nuts • A, B, C, F Tapping Screws • Stove Bolts • Wood Screws • Type U Drive Screws • Carriage Bolts • Continuous Threaded Studs • Hanger Bolts • Dowel Screws

WAREHOUSES

New York • Chicago • Dallas • Los Angeles

Processor stops Dual Corrosion with *Carpenter* Bi-Metallic Tubing

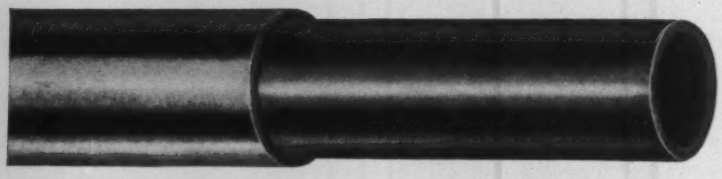


- Two dissimilar corrodents in heat exchange processing equipment raised havoc with stainless tubing. Hot corrosive vapors caused little trouble within the tubes. But brackish cooling water on the shell side was a real problem. The stainless tubing had to be replaced every two years at a cost of about $20,000 in materials, labor, and downtime.

  After unsuccessful trials with several special stainless grades, Carpenter Bi-Metallic Tubing was installed in the problem condenser. It was 18 gauge Type 304 welded stainless on the inside bonded mechanically to .035" deoxidized copper tubes on the outside. Ferrules on the tube ends facilitated rolling into Type 304 stainless tube sheets.

  After more than four years, Carpenter's Bi-Metallic Tubing was still operating —with life expectancy set for 8-10 years of trouble-free service.

  Carpenter Bi-Metallic Tubing is available in a variety of stainless-carbon, copper, brass and other combinations to solve dual corrosion problems. For details or help, call your nearby Carpenter representative or contact The Carpenter Steel Company, Alloy Tube Division, Union, N. J.



your master key to cost savings

Carpenter

Bi-Metallic Tubing

FATIGUE CRACKS

Look Ahead

This week The IRON AGE wraps up the tenth of its quarterly surveys of capital appropriations by metalworking companies.

With two and one half years under its belt, the metalworking capital appropriations survey is now a well-recognized marketing tool for those companies in metalworking and those selling to metalworking.

Who'll Spend—Not only can it be used to tell which of the 39 industries within metalworking will be spending more or less for capital goods next year, it also can be used to determine the course of general business in coming months.

We must admit, when we first started out, we never expected it to turn out so well. Of course, we knew that the National Industrial Conference Board, which conducts the survey for us, was one of the most-respected business research organizations in the country.

Top Secret—However, the type of confidential information we were after does not come readily. In many cases, capital appropriations are regarded by top management as strategic, top-secret information.

In fact, the Board tells us, (we don't see individual company reports and neither does any one else) there have been cases where higher figures for some industries were questioned by people whose own management was a strong factor in boosting the totals.

Yet, it is a tribute to the soundness and value of the survey that it now covers more than two thirds of the employment and capital goods buying power of all metalworking plants.

And we can point with pride to that fact that our appropriations data leads actual spending data anywhere from nine to twelve months.

This week's report on p. 39 gives the capital goods spending outlook through the first half of 1961.

Safety Record

All employers are conscious of the high cost of on-the-job accidents. They result in lost time, production slowdowns, and countless other harassments.

But now employers are finding out that accidents off the job can be just as costly.

The DuPont Co., Wilmington, Del., is now undertaking a project aimed at curbing the number of off-the-job accidents that have disabled employees. During the past nine months DuPont says 1500 of its workers were injured in mishaps that occurred away from the plant. The result is the same as if the accidents had happened while the individual was at work. It means lost time, added expenses, hardships.

Numbers Up — DuPont, which has won the Award of Honor of the National Safety Council 15 times, say its employees are safer on the job than they are during off hours. It has been laying more and more stress on off-the-job safety.

Among the leaders in the past three months were falls, 28 workers; traffic accidents, 13; and play, 10. In the fall category, six persons fell down stairs, two off horses, three off curbs, one in the mud and two said only that they "fell in public" apparently causing bruised feelings as well as bodies.

It's Capsule History

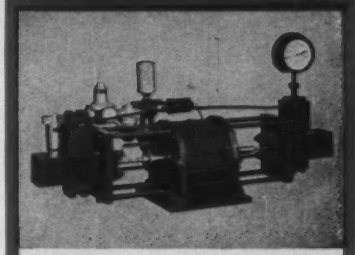
The history books of 2060 will have a supplement as factual as time itself. It'll be in the form of memorabilia that most historians will probably find too trivial to record in chapters on 1960 life.

The supplement is wrapped up in a Reynolds aluminum alloy time capsule which was recently placed into the facade of the new Town House East, New York. What 2060's historians find may be enlightening—to say the least.

Among other things included in the capsule are Nixon and Kennedy campaign buttons, a set of false teeth (for 2060's dentists to study), and menus from four New York restaurants.

ALDRICH

AIR-DRIVEN HYDRAULIC PUMPS



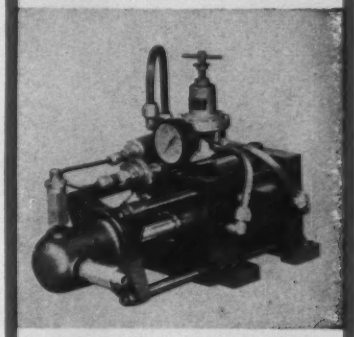
For production service: Heavy duty 6-inch stroke pump, single or double acting.

For production or laboratory . . . handling small volumes of fluid at pressures up to 50,000 psi.

For hydrostatic testing . . . tubing, valves and pressure vessels.

For operating hydraulic presses, cylinders and valve positioners.

Immediate shipment from factory stock.



For intermittent service: 3-inch stroke pump has low first cost, high reliability.

Aldrich air-driven hydraulic pumps operate on normal plant air. They are compact, simple to install, economical to operate. Write today for Data Sheet 36 (6-inch stroke) or Data Sheet 36A (3-inch stroke).

ALDRICH

ALDRICH PUMP COMPANY

8 PINE STREET, ALLENTOWN, PA.

Koroseal linings installed by New England Lead Burning Company, San Leandro, Calif.

Aluminum soaks in an acid bubble bath

SUBMERGED in that tank are racks of aluminum parts being anodized. The solution is sulphuric acid—so corrosive it eats holes in steel.

For years, the only way of keeping the dangerous acid from leaking out was to line metal tanks with lead sheets. This cost a lot, yet wasn't altogether foolproof. Every so often, a "wild" electric current would punch a hole in the lead lining. The whole department waited while the repair crew plugged the leak.

Then came Koroseal, the flexible material developed by B.F.Goodrich, that can stand practically all acids. When the aluminum fabricating company opened its new plant (shown above), the new sulphuric acid tank was lined with Koroseal. That was a year and a half ago. Since then, no leaks, no repairs, no delays in production.

Today, there are scores of installations in industry where Koroseal tank linings are handling acids and chemicals that ruin other materials—and doing it better and for less money than was ever possible before. If you have a tank lining problem, it's quite likely that we have the Koroseal or rubber lining that'll solve it. Try us. For information, write *B.F.Goodrich Industrial Products Co., Dept. M-886, Akron 18, Ohio.*

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TANK LININGS

COMING EXHIBITS

Plant Maintenance & Engineering Show — Jan. 23-26, International Amphitheatre, Chicago. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

International Heating & Air-Conditioning Show—Feb. 13-16, International Amphitheatre, Chicago. (International Exposition Co., 480 Lexington Ave., New York 17.)

MHI Pacific Coast Show—Feb. 22-24, Cow Palace, San Francisco. (Material Handling Institute, Inc., One Gateway Center, Pittsburgh 22.)

Western Metal Show—March 20-24, Pan Pacific Auditorium, Los Angeles. (American Society for Metals, Metals Park, Novelty, O.)

MEETINGS

JANUARY

The Institute of Scrap Iron & Steel, Inc.—Annual convention, Jan. 8-11, Hotels Fontainebleau and Eden Roc, Miami Beach, Fla. Institute headquarters, 1729 H St., N. W., Washington 6, D. C.

Aluminum Window Mfrs. Assn.—Annual Meeting, Jan. 9-12, Emerald Beach Hotel, Nassau, Bahamas, Association headquarters, 630 Third Ave., New York.

Society of Automotive Engineers, Inc.—Annual meeting, Jan. 9-13, Cabo Hall and Convention Arena, Detroit. Society headquarters, 485 Lexington Ave., New York, N. Y.

Hoist Manufacturers Assn., Inc.—Annual meeting, Jan. 10, Statler Hotel, Cleveland, Association headquarters, One Thomas Circle, Washington.

Steel Shipping Container Institute, Inc.—Winter meeting, Jan. 17-18, St. Regis Hotel, New York. Institute headquarters, 600 Fifth Ave., New York.

Steel Plate Fabricators Assn.—Annual meeting, Jan. 18-20, Logo Mar Hotel, Fort Lauderdale, Fla. Association headquarters, 105 W. Madison St., Chicago.

Industrial Heating Equipment Assn., Inc. — Annual winter meeting, Jan. 23-24, Dearborn, Mich. Association headquarters, 2000 K St., N. W., Washington, D. C.

Instrument Society of America—Annual meeting, Jan. 23-25, Hotel Astor, New York. Society headquarters, 313—6th Ave., Pittsburgh.

Society of Plastic Engineers, Inc.—Annual technical meeting, Jan. 24-27, Shoreham & Park Sheraton, Washington, D. C. Society headquarters, 65 Prospect St., Stamford, Conn.

National Tool & Die Manufacturers Assn. — Winter board meeting, Jan. 24-28, Biltmore Hotel, Palm Beach, Fla. Association headquarters, 907 Public Square Bldg., Cleveland.

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The NEW SUPERIOR MODEL "J2" Honing Machine

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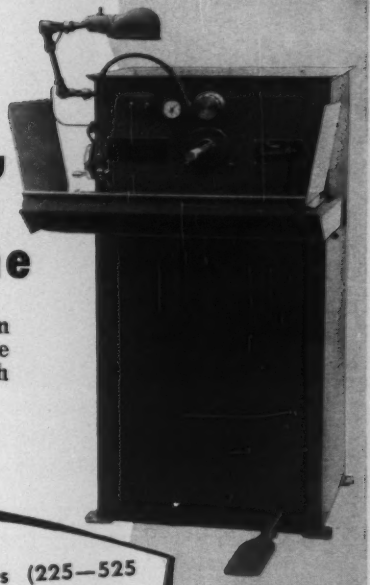

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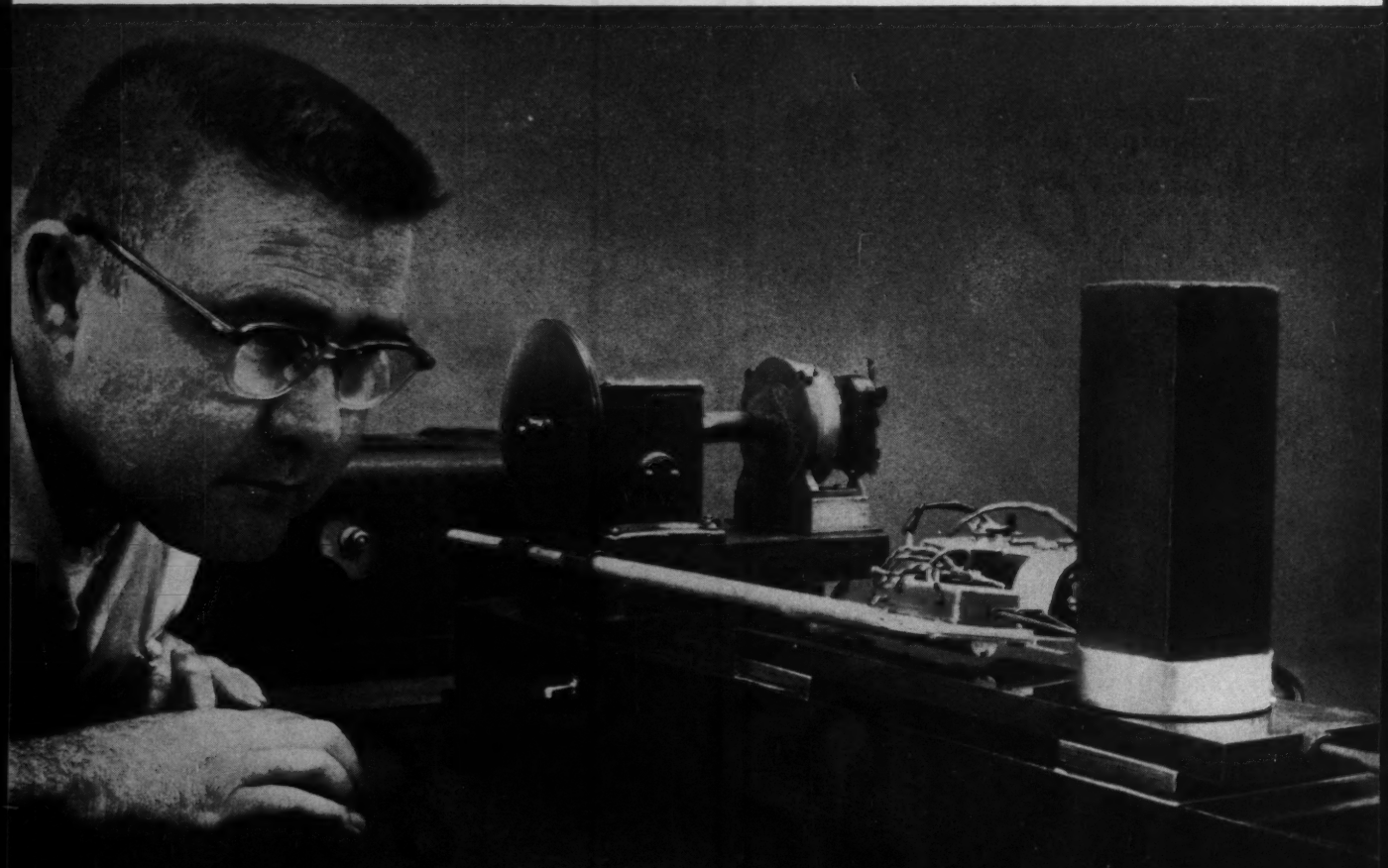
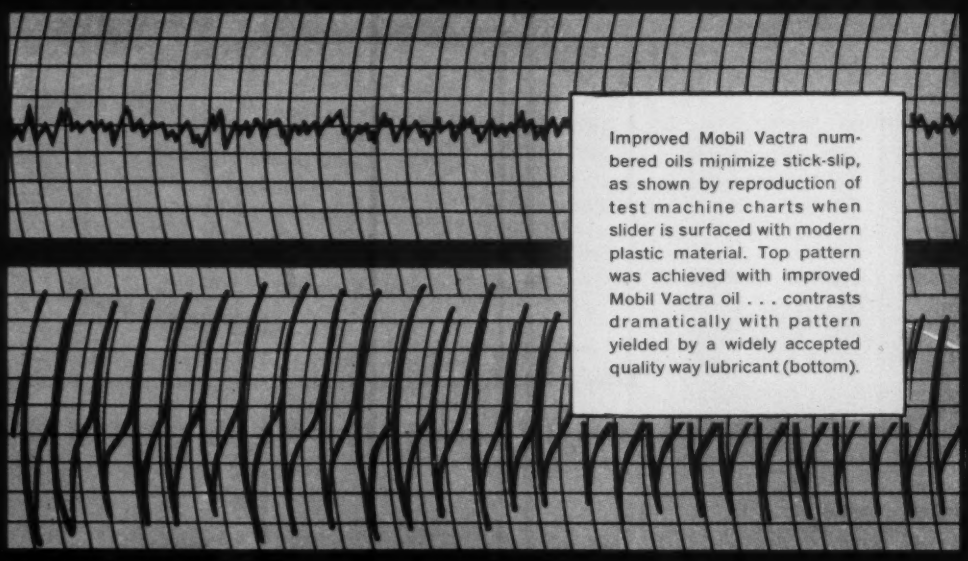


Stick-slip tester developed by Mobil's research laboratories closely simulates operating conditions of today's machine tools . . . records stick-slip electronically as weighted slider is pulled across lubricated cast iron bed.



Improved Mobil Vactra numbered oils minimize stick-slip, as shown by reproduction of test machine charts when slider is surfaced with modern plastic material. Top pattern was achieved with improved Mobil Vactra oil . . . contrasts dramatically with pattern yielded by a widely accepted quality way lubricant (bottom).

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UNION CARBIDE METALS

Only **ELECTROMET** ferroalloys from **UCM** are so deep in extra values to help you.

APPLIANCE LEADERS EXPECT SALES INCREASES IN 1961, according to a survey. Of 22 industry leaders queried, 15 expect increases in 1961 sales ranging from 2 to 5 pct on high-saturation items, and 25 pct on growth items like dishwashers. None of the executives expect a sales decline in 1961. Seven look for sideways movement.

A SHORTER CADILLAC WILL BE INTRODUCED NEXT MONTH. To be called the Town Sedan, it will be 7-in. shorter than standard 222-in. Cadillacs. This is accomplished by bobbing the rear deck (trunk). Otherwise, it is the same as other six-window sedan body styles. Factory list price is expected to be slightly over $5000. Explanation: Buyers want a shorter car.

JAPAN LIKES U. S. MACHINE TOOLS. Even though European-made tools are usually cheaper, promise of prompt deliveries can often win sales for U. S. toolmakers.

ANOTHER FOREIGN MARKET FOR METALWORK PRODUCTS is Peru. A recent Commerce Dept. study shows that Peru offers a ripe market for farm machinery, calculators, electric motors and machine tools. The U. S. enjoyed almost half of 1959 Peruvian imports of $294 million. Key factors in selling this market are prices and credit terms.

AMERICAN MOTORS CORP. WILL SHARE COMPANY SALES GAINS with the "neglected consumer." Retroactive to Dec. 1, 1960, buyers of cars during the next four months will receive U. S. bonds in the amounts of $25 to $125 based on sales increases of 10 to 50 pct. With expected sales of about 200,000 cars in the period, AM president George W. Romney can look to that many more salesmen for his cars.

RECORD-BREAKING LP-GAS INDUSTRY OFFERS A BROAD MARKET. Industry sales jumped 10 pct in 1960 to a record 10 billion gallons. The industry is interested in large rail tank cars, new pipelines and high-speed truck loading and unloading equipment.

A SALES IMPROVEMENT FOR CONSTRUCTION MACHINERY for the first half of 1961 over the 1960 pace is forecast by L. B. Neumiller, board chairman, Caterpillar Tractor Co. He also expects public construction in highways, dams and schools to increase in 1961. He predicts a decline in foreign sales.

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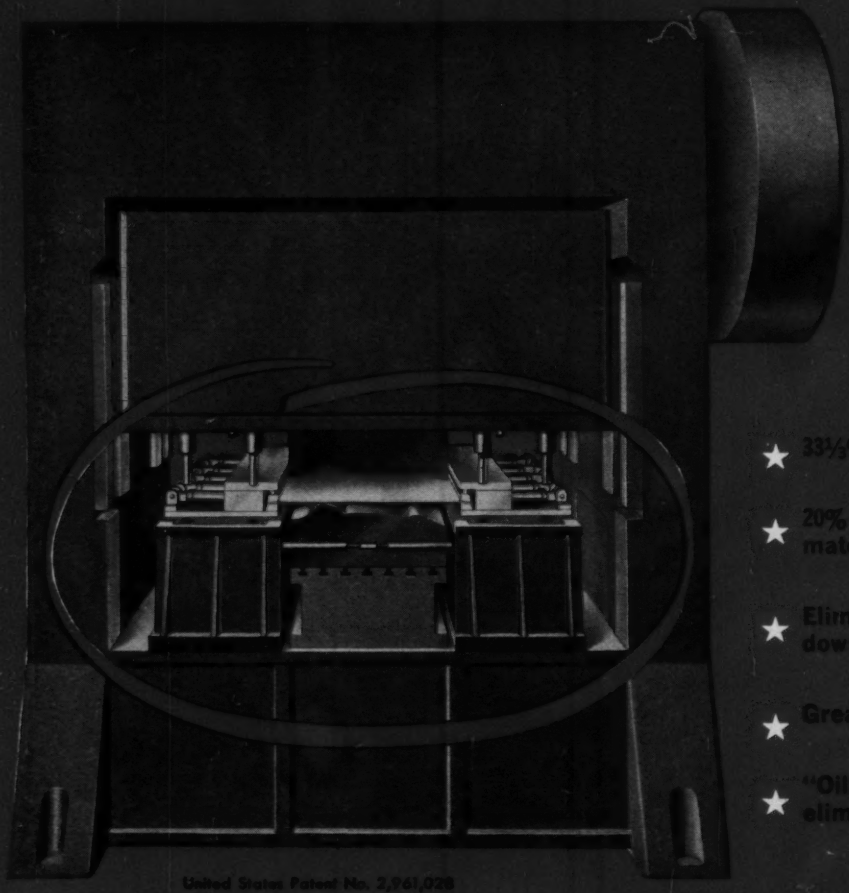

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Technological Progress Brings Change to Tool Steel Industry

Latrobe Steel Co. president J. E. Workman says changes in depreciation policies are the key to competition with foreign producers.

He also discusses the direction of the tool steel industry in this interview with IRON AGE Pittsburgh editor G. J. McManus.

■ American steel mills can compete with foreign producers but it's going to take new thinking on replacement and modernization.

This view comes from J. E. Workman, president of Latrobe Steel Co. and head of the tool steel producers committee of American Iron & Steel Institute (AISI).

For tool steel, at least, Mr. Workman feels rapid modernization has become a must. He says this means new recognition by management of the pressure for change; it means depreciation laws that go with a faster rate of progress.

"If we were simply treated as the tool steel industry in Europe," says Mr. Workman, "we'd be a long way toward being competitive."

An Old Theme—The theme of depreciation reform is not new in the steel industry. But recent statements of tonnage producers have emphasized inflation as the main problem. Steel facilities are built to last 20 or 30 years, they argue. Depreciation rules should allow for inflation in setting the amounts to be provided for replacing these facilities.

Mr. Workman agrees inflation is a problem. But he says tool steel companies can no longer wait 20 years or more before replacement and modernization.

He cites the case of a bar turning machine at Latrobe Steel. The machine was installed 10 years ago; it is only about half written off. But it must be replaced because the newest bar turners are at least 10 times more efficient.

Equipment Prices Up — Even over short spans, the dollar deficit is made more painful by the fact that equipment keeps getting more expensive. This is partly inflation, but machine improvements can be a bigger factor. Latrobe will have to spend $100,000 for a new and better turning machine. The unit bought 10 years ago cost $10,000.

But the money for costly new machines must be found, says Mr. Workman. Companies and government officials have got to get away from replacement timetables that date back 20 years or more.

"We have to recognize that technological changes are coming more rapidly every day," he says. "I think the next 10 years could make

LATROBE'S WORKMAN: "In tool steels, we have so many grades it's pitiful. But it isn't the steel, it's what the customer thinks."

Latrobe's Workman Comments:

"If we were simply treated as the tool steel industry in Europe, we'd be a long way toward being competitive."

"Technological changes are coming more rapidly every day. The next 10 years could make the last 10 look like the horse and buggy days."

"American business psychology is catching on everywhere."

the last 10 look like the horse and buggy days."

Encouragement Overseas — Foreign producers, he points out, are given every encouragement to keep plants up to date. A Japanese plant can write off half the value of a new facility in the first year. Sweden allows a 50 pct write-off in two years.

West Germany and the Benelux countries allow rapid and flexible write-offs on the basis of individual negotiation. A plant can be fully depreciated in five or ten years in West Germany.

With the same kind of treatment, says Mr. Workman, American mills could compete in the world market. Foreign producers have the advantage of low labor costs. And postwar rebuiding programs have given them relatively new and modern plants.

Technical Assets—However, Mr. Workman feels this country has a big asset in its store of technical knowledge and technical people. Years of practical experience have gone into building this stockpile, he says. It will take Europe time to ease its present shortage of technical people and pull even with us.

While the U. S. has the technical advantage, Mr. Workman notes, it can stay one step ahead of foreign competition. Given the same modern tools, he feels, American mills are organized to operate more efficiently than companies abroad.

But U. S. industries must modernize at least as rapidly as the Germans or the French, says Mr. Workman. To do this he feels the American producer must get the same break on depreciation as his foreign competitor.

Moreover, he suggests the time for equalizing ground rules may be running out. He sees foreign producers rapidly improving management quality. . . . "The American business psychology is catching on everywhere."

More World Competition—And world competition is spreading to more products. Austria, with a nationalized tool steel mill, is aggressively selling die steels in this country and Canada. Foreign competition is "approaching serious proportions," says Mr. Workman of his industry.

In meeting this competition, tool steel men are handicapped by several conditions that work against efficiency and promote waste motion. For one thing, producers have chopped their market into many small pieces. Each company has its own special grades and grade names.

"We have so many grades, it's pitiful."

Work by technical societies and companies has taken a lot of the mystery out of grade names, he says. There has been some standardizing of requirements. But he feels the craftsmanship of tool steel production and use will always emphasize minute quality differences. General purpose grades are not readily accepted by the die maker who has worked for years with one special steel.

"It isn't just what a steel can do," says Mr. Workman. "It's what a customer thinks it can do."

Need Industry Dope—Efforts are also being made to develop industry-wide dope on tool steel use. Under an AISI program, producers are now comparing market notes for the first time. Early results indicate past notions of industry and area usage were way off the mark in some cases. Sales programs are being reshaped.

However, greater efficiency is seen as the big need of the industry.

"We have tremendous capacity," claims Mr. Workman. "In at least several plants, stainless facilities can be applied to tool steel. Our problem is not so much capacity; it's capacity at low cost."

Along with straight cost pressure, two kinds of technical progress are working towards drastic equipment change. First, new applications are starting to crowd the upper limits of ordinary structural alloys. When you get beyond these limits, you are into alloy tool steels.

"A whole new technology may lead us down a different road," he says.

As an example of this kind of change, he cites the use of tool steels for aircraft landing gear. Over a broad area, he feels, design concepts are on the brink of tool steel properties.

A Wider Horizon—Closely rerated to this trend, new production techniques are widening the horizon for tool steel. Vacuum melting, says Mr. Workman, is giving the mills much more flexibility in the use of additives.

The new needs and new means have caused tool steel men to take a different look at their markets.

According to Mr Workman, producers are now very much interested in pushing tool steel as a component metal. They no longer see their product tied exclusively to its traditional role in production.

What to Expect from Goldberg

A Friend in Court for Unions, But No Extremist

You can't expect Goldberg to abandon his strong union ties over night.

But he has outstanding ability and will do the job assigned by President-elect Kennedy.
By Tom Campbell

■ The next Secretary of Labor is not a complex personality. The fact that he is so logical and yet emotionally human puzzles some management people.

Arthur J. Goldberg, until his appointment by President-elect Kennedy to Secretary of Labor, has been general counsel and a chief negotiator for the United Steelworkers of America. He has also served as counsel to other AFL-CIO unions.

Because of his prominence in negotiations, many refer to Mr. Goldberg as an officer in the USW, rather than its retained counsel. And often he has counseled courses just the opposite from those of union leaders.

A Respected Man—Probably the greatest tribute to Mr. Goldberg comes from independent lawyers in the industrial relations field—those who represent management. They consider the Sec. of Labor appointee probably the greatest labor lawyer in modern industrial relations history.

Arthur Goldberg appears to have a split identification pattern.

He is equally at home arguing before the Supreme Court of the United States or hammering home his point in a smoke-filled suite surrounded by hard-headed and practical union officials.

His pet philosophy is a cooperative labor-management approach to head off what he feels will be compulsory arbitration by government —if hassles affecting the public interests continue to crop up.

How Biased—Is he biased in favor of organized labor? Of course, he probably is, but he is far less biased than most of the union officers he represents.

Known by only a few insiders is the fact that Mr. Goldberg furnished the final formula which settled the 1959 steel strike. It was his idea of pledging the cost-of-living features against any unlooked-for rise in insurance costs. This placated management and the strike was practically settled.

Work to Do—Mr. Goldberg will face a tough job as Secretary of Labor. But his integrity will not be questioned. Those in management circles who know him fear no prejudicial action on his part.

But it must be said that the AFL-CIO now has a friend in court.

Industry Reaction—The feeling in the steel industry is a trifle mixed. A few who do not know Mr. Goldberg well have jumped to the conclusion that he will favor labor in any issue in which he is involved.

However, those who have been in the liaison with union officials and Mr. Goldberg suggest that the new Secretary of Labor's level-headedness will do more good keeping labor on the beam than he was able as counsel.

WITH FORMER BOSS: Arthur Goldberg, here with USW president David McDonald, won his national reputation as negotiator for Steelworkers.

AISI Discards Operating Rate

Reporting of ingot production as a percent of steel's rated capacity will be ended by AISI in January.

Instead, the Institute will use tonnage figures and index based on 1957-59 output.

■ As of the first of next year, the American Iron and Steel Institute will cease reporting steel ingot production as a percentage of rated capacity. This was expected for reasons outlined in some detail on these pages last week (IA Dec. 15 p. 80).

In announcing the change, the Institute explained that it would substitute tonnage and index figures. These will permit rating the industry's performance on a national basis; and it will still permit comparisons among the 11 steelmaking districts.

Why the Change?—Technological advances that increase production without enlarging existing furnaces were cited to explain why it is becoming more and more difficult to use "capacity" as a way of measuring steel activity.

The IRON AGE began reporting steel output on a capacity basis in the early 1900's. The Institute took over the series in 1917. And so, for some 50 years "percent of capacity" was a useful measure of steel activity. It was reported weekly, monthly, and annually on a national and on a district basis.

No Capacity Data—Now, it appears that capacity data may not even be collected. Publication of capacities of companies, districts, and the nation may be dropped. So will an estimate of operations for the forthcoming week.

The Institute will release the following data weekly, starting in January:

(1) **Total tonnage** of ingots and castings made during the previous week.

(2) **Tonnage made in** the previous week and the percentage gain or loss from that figure.

(3) **Tonnage for the current year** to date and for the same period of the preceding year. Percentage gain or loss from the previous year's figure will also be reported.

(4) **An index** of total U. S. production for the week. Base of the index will be 1957-1959 = 100.

(5) **A similar index** for each of the nation's eleven steelmaking districts. These are the districts now used (see p. 85).

Higher Base — The new index will be based on 1957-1959, a period during which production averaged 97 million tons a year. Since some U. S. government indices will soon switch to a 1957-1959 base, the Institute elected to start on the forthcoming base, rather than switching later.

See Editorial, p. 5

Changes in Reporting Steel Production

Methods of reporting steel ingot output will soon change. Here are the data which American Iron and Steel Institute has been reporting compared with what will be issued next year:

CURRENT BASIS	NEW BASIS
1. Total ingot output for previous week, TONS OF INGOTS	1. Total ingot output for previous week, TONS OF INGOTS
2. Total ingot output for previous week, INDEX (1947-49 = 100)	2. Total ingot output for previous week, INDEX (1957-59 = 100)
3. (Not currently reported)	3. Comparison of past week's output with previous week, PERCENT
4. Estimated ingot output for forthcoming week, TONS	4. (Will not be reported)
5. Estimated ingot output for forthcoming week, INDEX	5. (Will not be reported)
6. Actual ingot output for one month ago, TONS OF INGOTS	6. (Will not be reported)
7. Actual ingot output for one month ago, INDEX	7. (Will not be reported)
8. (Not currently reported)	8. Output, year to date, TONS OF INGOTS
9. (Not currently reported)	9. Output, year to date in previous year, TONS OF INGOTS
10. (Not currently reported)	10. Comparison of year to date output with previous year, PERCENT
11. Ingot output in 11 steelmaking districts, PCT OF CAPACITY	11. (Will not be reported)
12. Estimated output in steelmaking districts, PCT OF CAPACITY	12. (Will not be reported)
13. (Not currently reported)	13. Ingot output in 11 steelmaking districts, INDEX (1957-59 = 100)

Our National Goals—4

Foreign Trade Policy

U. S. Trade Policy for the '60's

The next ten years will see new and changing patterns of world trade.

The U. S. will face the problem of strengthening world ties while keeping the domestic economy strong.
By E. C. Beaudet

■ What is the best course for U. S. trade policy to follow in the 1960's?

Will it become more liberal than it is now, or will there be growing need for more protectionism? Either way, what will be its effect on our international relations and the domestic economy?

One thing about these questions is fairly certain. These, and others like them, will be wrestled with constantly during the next decade.

Upper Hand — At the moment, the more liberal view seems to have the upper hand. The report of the President's Commission on National Goals comes out strongly for an expanded free trade policy.

The report states, "The healthiest world economy is attained when trade is at its freest. This should be our goal."

A good part of the Commission's recommendations is grounded on a thorough analysis of foreign economic policies by The Chase Manhattan Bank's board chairman, John J. McCloy.

Mr. McCloy, in a report prepared for the Commission, says the foreign economic policy of the 'Sixties "promises to be of decisive importance."

New Challenges—To back this up he points to four new challenges which have helped shape our foreign economic policy in recent years.

These are: Revolutionary changes in underdeveloped countries; the growing economic strength of Communist-bloc countries; Western Europe's and Japan's economic recovery; and the trend toward regional economic groups.

American trade relations with other nations, Mr. McCloy believes, will have the most influence in meeting these new challenges to U. S. foreign economic policy.

Attacks—He notes that present trade policies (particularly as they affect competition from imports and the balance of payments), are under increasing attack. Despite this, he does not feel that protectionism is the answer.

Rather than raise tariff barriers, the U. S. should lower them and encourage more trade between nations. The U. S. cannot go it alone, however. Other nations, including those in trading blocs, must cooperate.

To this end, Mr. McCloy calls for the United States to work toward a 50 pct cut in tariffs on industrial products by Common Market countries and other industrial nations The 50 pct reduction should be taken in steps over the next decade to reduce problems of adjustment.

Lower Quotas — At the same time, all industrial nations should honor efforts of the General Agreement on Tariffs and Trade to eliminate quotas and other quantitive restrictions on trade.

Eventually, this will require the

NEXT WEEK

The U. S. Economy And The Decades Ahead

The fifth and final article in this series on the report of the president's Commission on National Goals appears next week.

Its purpose: To relate economic, technical and scientific endeavor to national goals for the decades ahead.

New Challenge to Foreign Economic Policy

In his report to the Commission on National Goals, Chase Manhattan's board chairman, John J. McCloy reaffirms the basic, historical U. S. position on foreign economic policy:

"To help build a world at peace, in which all men have an opportunity to lead lives of purpose, freedom and fulfillment."

The obstacles to achieving this goal, he notes, are more formidable than ever before. Recently, four major developments have challenged and helped shape our foreign economic policy. They are:

Underdeveloped Countries

No longer are people of underdeveloped countries content with their lot. They are changing living patterns, sometimes drastically, to gain a new and better life. Thirty-eight new nations, chiefly in Asia and Africa, have sprung up in a way that breaks with old traditions.

Growing Communist Power

Communist bloc nations, particularly Russia and China, are growing stronger. So is their potential for external economic expansion and aggression. The U. S. and the West must look for more competition from them, particularly in winning the favor of underdeveloped countries.

W. Europe and Japan

The economic resurgence of W. Europe and Japan has strengthened the Free World position. But it has also posed problems of competition.

Trend Toward Trade Blocs

Along with W. Europe's economic comeback has come the formation of two major trading blocs: The European Common Market and the European Free Trade Assn. Both aim to eliminate trade barriers among members, while maintaining them against outsiders. This idea is spreading to Central and South America. The Middle East and Africa may be next.

U. S. to remove import quotas on oil, lead and zinc. In turn, other countries would be expected to eliminate their quotas on coal, autos, machinery and a long list of other U. S.-export items.

But to reduce world trade barriers effectively, Mr. McCloy states there must also be some changes in present U. S. trade legislation.

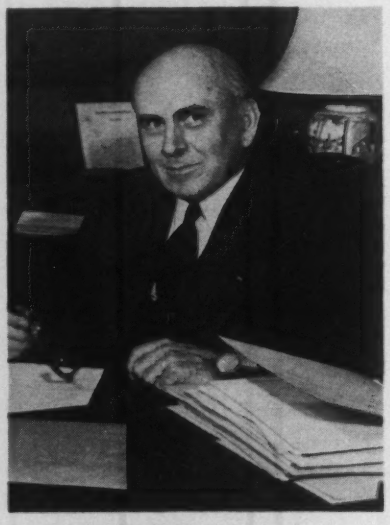
Tariff Revision—He points out that tariff reductions in the past ten years have almost come to a halt. Those that have been reduced mainly concern very high-duty items which have no real impact on stimulating trade.

Meanwhile, the "peril point" and "escape clause" provisions of the Reciprocal Trade Agreements Act have been greatly strengthened.

These provisions, Mr. McCloy says, limit tariffs to levels which restrict imports only to a small proportion of the domestic market. Also, they empower the President to raise tariffs on imported goods which seriously threaten domestic producers.

New Methods—To pursue an effective foreign trade policy in the 'Sixties, Mr. McCloy feels these clauses should not only be modified, but that new techniques for bargaining with other countries must be developed. Reciprocal trade concessions should no longer be arrived at product-by-product.

He points out that countries in W. Europe have already adopted plans to cut tariffs by groups of products rather than individual items. This is more flexible, he says, and permits trade bargaining to focus on the overall reduction of international trade restrictions.



JOHN J. McCLOY: "If we are to be successful in the great task that confronts us, domestic policies must be correlated with foreign."

Safeguards — Despite his arguments for freer trade, Mr. McCloy does not overlook the necessity for special safeguards.

The U. S. trade-policy objective in these cases, he says, should not be to bar lower-cost products on a permanent basis. Rather, U. S. safeguards should be applied and then gradually reduced over a period of time to permit industry and labor to adjust to changes.

However, where there is the possibility of serious, long-term damage to an industry, the government should lend assistance both to workers and employers.

Repay Cost—On the whole, it is up to the United States as a creditor nation to adopt more liberal trade policies and promote international trade, Mr. McCloy claims.

Such trade policies in the 'Sixties will more than repay the cost. They will, Mr. McCloy says, bring about higher living standards at home and strengthen the Free World against the Communist challenge.

New Aluminum Process Coming

Last summer, reports of a new aluminum production process stirred the industry.

Pilot plant production should result in some major decisions.
By F. J. Starin

■ Aluminium Limited, major Canadian producer, is very tight-lipped about its new process for making aluminum, in spite of wide interest. But, when interviewed by The IRON AGE at company headquarters at Montreal, several executives made some grudging comments.

The company had announced its "completely new" process for making aluminum back in July. It was revealed then only because the company was about to buy the equipment for its pilot plant, last step in pinpointing capital and operating costs, and anticipated some questions.

Since then, the company has officially said only that it expected the new process to be "substantially" cheaper to build and operate than the conventional method. And bauxite and power needed would be about the same.

Long-Term Prospects—The big question: Will the process be economical enough to obsolete current production facilities? Aluminium executives say they won't really know until pilot plant tests are completed. But it appears very likely.

A top technical executive explained the range of possibilities. Maximum: The process may produce such substantial savings as to make it worthwhile to rapidly replace some existing capacity. Minimum: It may prove to be only slightly cheaper than the conventional process.

But unless the process proves out near the optimum end of the range, it will not be considered an out-and-out success. The company has had top engineers working on this for 10 years. And it is spending $4 million to build the pilot plant.

Tough Problems — Even if the new process proves out to the highest Aluminium expectations, putting it into commercial production will pose problems.

The company has 80,000 tons of capacity almost completed, which would have to be accounted for before any new expansion could be implemented.

He said the company has enough alumina and power capacity for another 200,000 tons of primary metal capacity. He anticipates the new process will be ready when the company builds this output.

Where to Locate—A top smelter man said that at this point he could see no reason why he couldn't operate a plant containing both conventional and new process capacity. This seems likely to be the initial approach.

Several top executives agreed that plants making aluminum by the new process probably would be built initially outside of North America. They look for these in countries struggling to develop, and offering incentives to new industry.

Another major question — how long before other aluminum producers could develop the same process. A top technical executive said the process is thoroughly covered by patents, some granted as recently as a year ago. He felt that even if another company discovered its secret they couldn't use it.

FUTURE IN DOUBT?: Reports on Aluminium Ltd.'s new aluminum production method focus attention on potlines, above. If it's a revolutionary success, present methods may be on the way out.

LOOK TO

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FOR PROGRESS IN METAL PROCESSING

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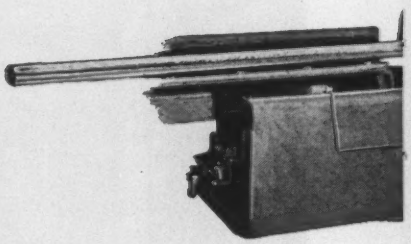
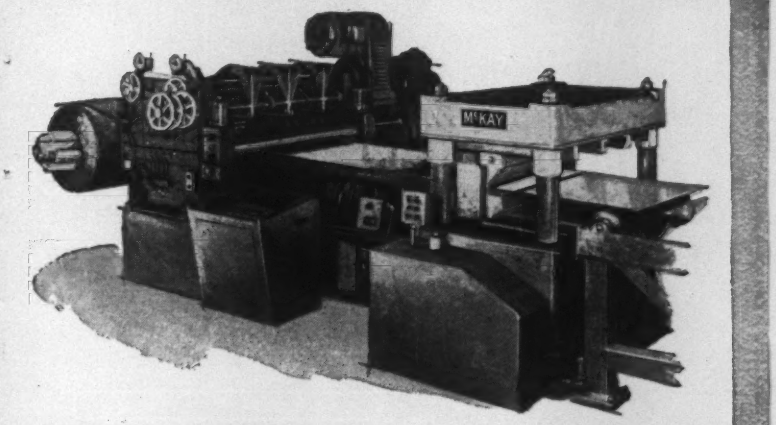
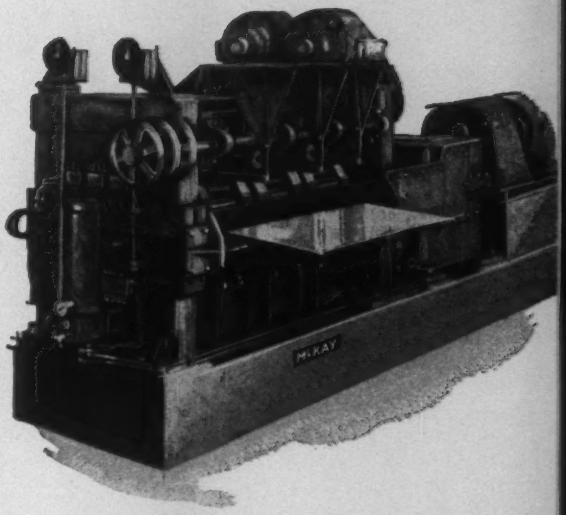




McKAYMATIC* DIE SHEAR LINES



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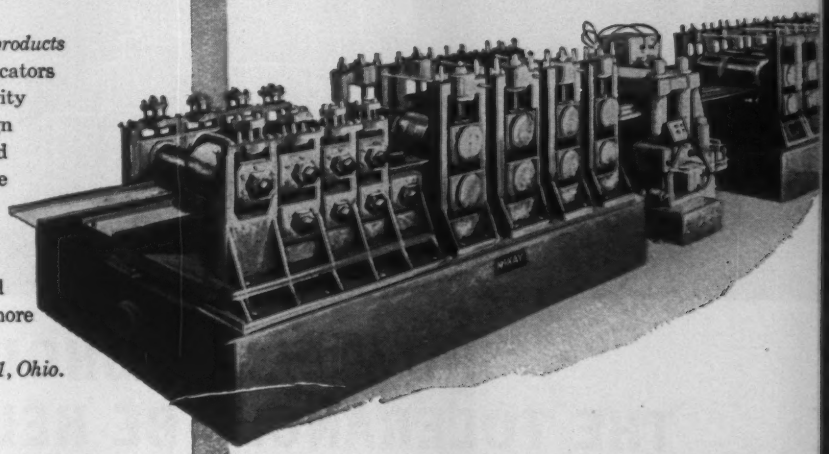
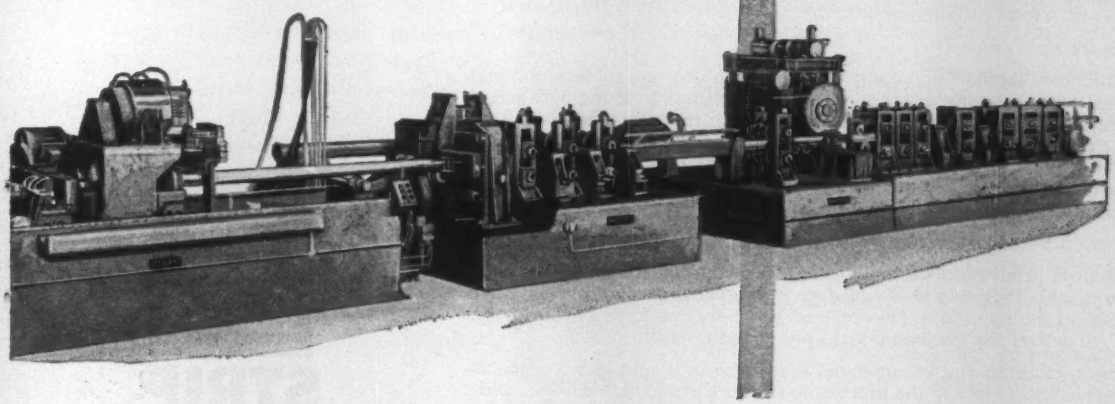
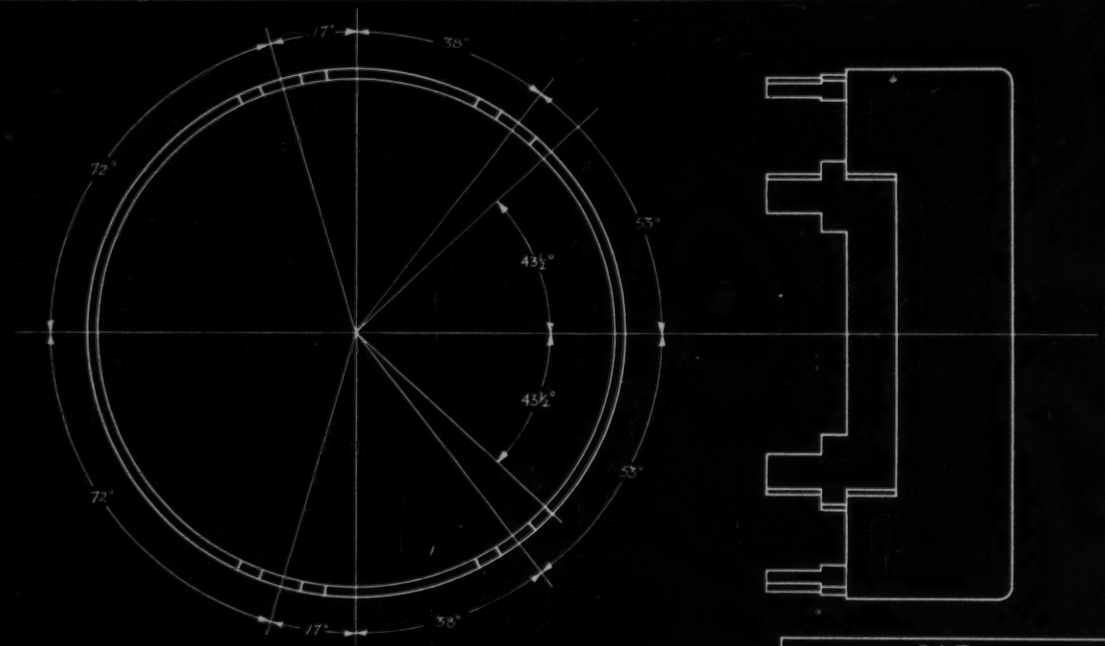
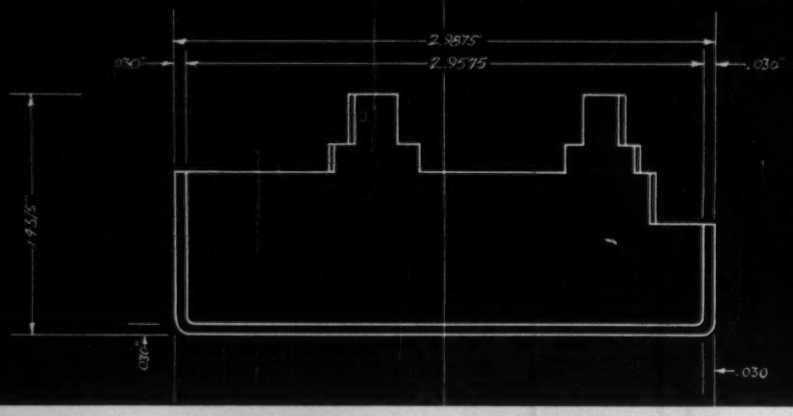


McKAYMATIC* FORMING MILLS







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ANALYSIS	AISI – 1010
SIZE	4½" x .030"
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WIDTH TOL.	± .005"
HARDNESS	Rockwell B 55 max
FINISH	#2
EDGE	#3 SLIT
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Managers Face Tough Decisions

Business problems are never easy to solve. But the ones faced right now are among the toughest.

Included are these: Deciding when business will improve, the profit squeeze, competing overseas, and changes in buyer demand.

■ Always difficult, management decisions are getting tougher.

During a boom it's not hard to decide what to do. Neither are decisions difficult during an all-out depression. But the current twilight gray economy keeps managers guessing.

Sound Ideas, But—On the one hand, business is urged to help get things moving. Among the suggestions: More vigorous selling overseas, more product research, modernizing to improve product quality and performance, greater marketing efforts.

All these are worthwhile, but the profit pinch makes them difficult. The latest IRON AGE quarterly survey of capital appropriations (see p. 39) shows how management is being forced to backtrack on spending plans.

Another tough problem: Deciding how severe the downturn is—and how long it may last. The current slowdown is far from a conventional one. Some statistics, such as gross national product and personal income, are setting records even while unemployment is increasing.

Leveling-Out Period—There are economists who believe industry never fully recovered from the 1958 recession. Pent-up demand before and after the steel strike did much to improve 1959's levels, they add.

Opinions also exist that the economy may be heading for a leveling-out period—with much shallower booms and longer, but less severe, recessions in the coming years.

Another factor enters into management thinking these days—international competition. This is a relatively new dimension in business planning and it leads to complex problems.

Buying Patterns — Still another problem that must be considered (especially by durable goods makers) are shifts in buyer demand. In the last four recessions the biggest impact has been on the durable goods industries. This time, through the third quarter this year, durables were down 8.2 pct, according to figures of the First National City Bank of N. Y. Nondurables, however, were only off 1.1 pct, construction had dropped 4.2 pct from 1959 peaks, and services had not changed at all.

Nondurables and services have been moving upward with few setbacks in the post-war period. This has helped the gross national product to increase. But, adds the First National, "there is a lack of any strong growth trend in durables and construction over the past five years. This is a key sector for creating more jobs and income. If the economy is to grow rapidly, the heavy industries must lead the way."

How Profit Pinch Hurts

■ Businessmen judge success by the balance sheet. That's why 1960 records in gross national product or production don't impress them too much.

More sobering, and important, is the steady shrink in profit margins during the year.

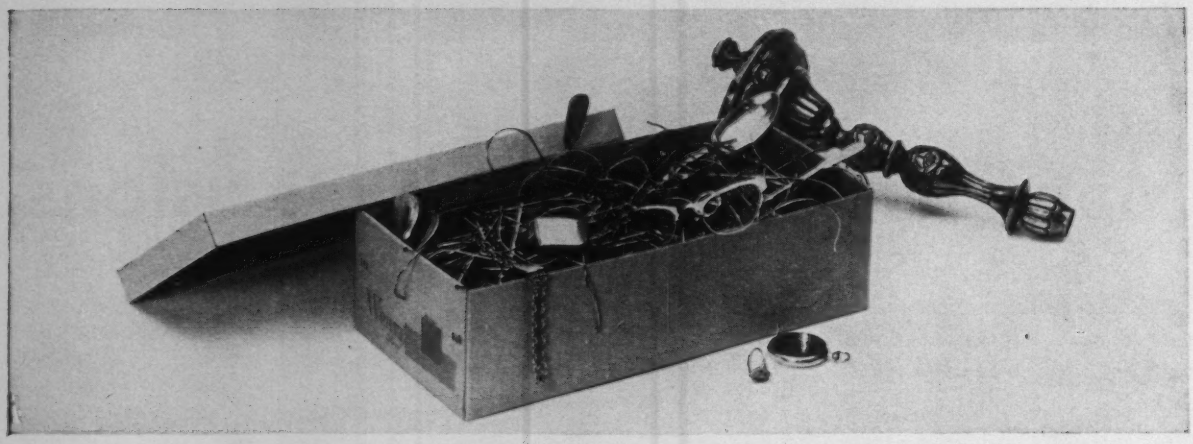
Vital Force—This decline helps explain why industry finds it difficult to spend for new machinery and equipment. And a look at the sources of capital spending reveals how important adequate earnings are.

Between 1947 and 1959, Dept. of Commerce figures show, U. S. corporations put $300 billion into plants and equipment. They also spent another $47 billion for inventories and $121 billion for other working capital growth.

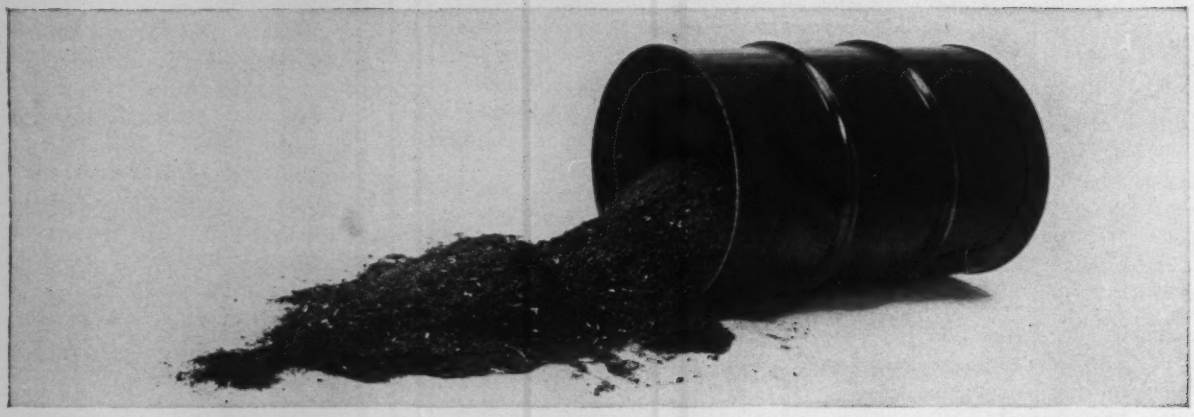
Where It Came From—Over 61 pct of all this spending ($287 billion) came from internal sources, financed from retained earnings and depreciation allowances. About 32 pct ($148 billion) came from long-term or short-term borrowing. The balance of 7 pct ($33 billion) was raised through new stock issues.

On this basis, funds generated by the companies themselves accounted for about 96 pct of the money spent for plants and equipment.

HERE YOU SEE IT



HERE YOU DON'T!



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To show you where profits lurk, we've included a list showing the various forms of precious metal waste.

It is by no means complete (it is possible that you have other forms). May we suggest that—should you be in doubt—you contact the Handy & Harman Refining Center nearest you. Further, if you are not in doubt about your waste bearing precious metals, but you are (or have been) in doubt as to its full value, it will profit you to send it to us. Our Bulletin 24 describes our Refining Division in detail. A copy awaits you at

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Capital Spending: Look For A Slow First Half

Metalworking's new appropriations for future plant and equipment spending continue to decline.

This means actual capital goods orders will be off through June. But the picture still looks better than 1958.

By E. C. Beaudet.

■ Plant and equipment spending by metalworking companies will fall steadily through the first half of next year.

This is the conclusion drawn from a third - quarter survey of new metalworking capital appropriations conducted for The IRON AGE by the National Industrial Conference Board.

The 39-industry survey shows metalworking companies set aside 35 pct less money for future capital spending than they did in the third quarter of last year.

Slow Decline—This was the third successive year-to-year cut in new appropriations and the largest in an exceedingly moderate decline from the peak reached in first quarter 1959. Also, new appropriations approved in third-quarter '60 fell 22 pct under the second quarter.

On this basis, the results of this most recent survey foreshadow a lower level of capital spending at least until June 1961. Capital appropriations in metalworking usually run anywhere from nine to twelve months ahead of actual expenditures for plants and equipment.

As yet, new appropriations figures do not indicate capital spending cutbacks as severe as those which took place in the first half of 1958.

In the first nine months of 1960, new metalworking capital appropri-

Fourth of a 1960 Series: Metalworking's Capital Spending Plans

THIS SURVEY of capital appropriations by metalworking companies is conducted quarterly for The IRON AGE by the National Industrial Conference Board.

THE NEXT report on fourth-quarter '60 spending plans will appear in a Mid-March issue.

ations totalled more than $2.7 billion. This is about 25 pct less than the $3.6 billion set aside for spending in the first nine months of 1959.

Better Than '58—However, it is still 50 pct higher than the $1.7 billion set aside in the same period in 1958 when investment plans were cut back by the recession. So, while far from bright, the capital spending picture for the first half of next year does not reflect recession levels of 1958.

Also, while new third-quarter appropriations fell 35 pct under third-quarter 1959 and 22 pct below second quarter '60, the downtrend has been remarkably gradual considering the usual volatile nature of the capital goods market.

Most Groups Off — Of the six major metalworking groups, all but one cut third-quarter spending plans below the same quarter last year.

The electrical machinery industry posted the largest cutback, 60 pct. This was followed by nonelectrical machinery which dropped 45 pct to register the next biggest decline.

The primary metals industry, which accounts for the most dollars spent for capital goods in the industry, was off 39 pct. Next came fabricated metal products with a 28 pct decline. The smallest cutback, 4 pct, was made by the transportation equipment industry.

Some Gain — Only makers of instruments and metal furniture planned to spend more for capital goods in coming months. They raised new appropriations 76 and 82 pct, respectively, over third-quarter 1959.

However, the dollar amounts planned for spending by these industries are small in comparison with the others and was not enough to offset the overall decline of 35 pct.

These year-to-year comparisons may be distorted since new appropriations in third-quarter 1959 were greatly reduced because of the steel strike.

Confirm Trend — But comparisons of second-to-third quarter '60 spending plans confirm the general downtrend in new metalworking capital appropriations. Overall they dropped 22 pct.

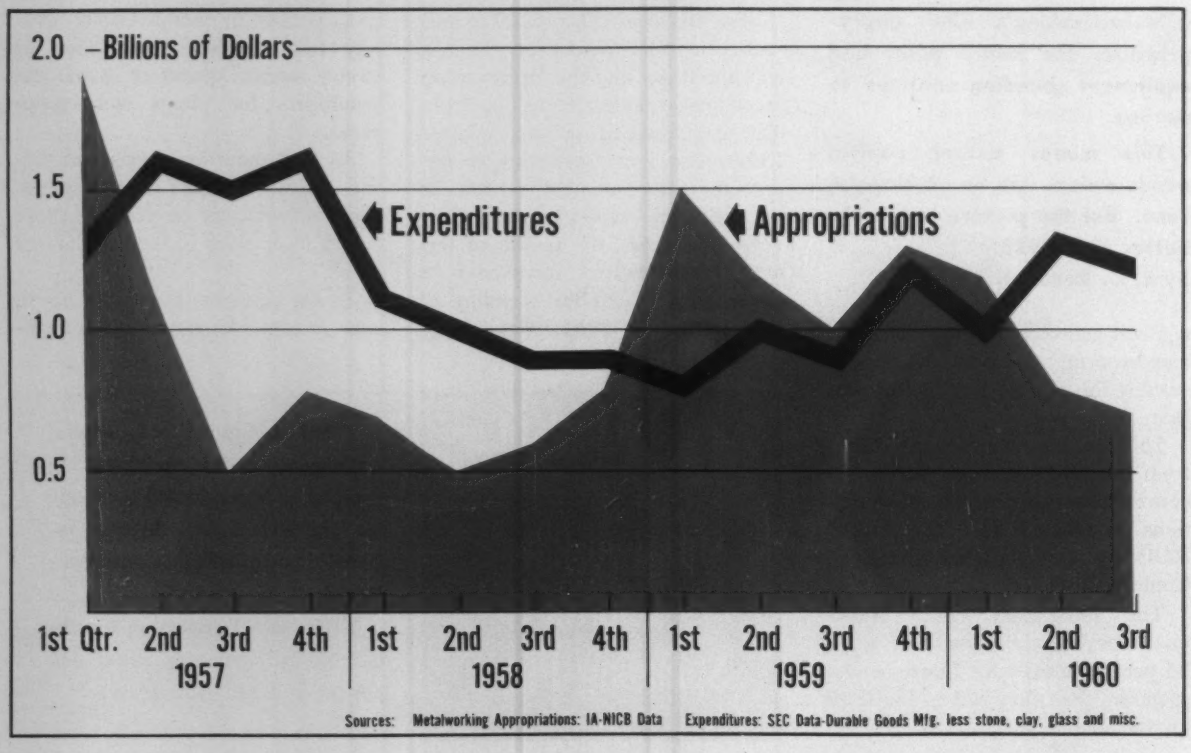
The primary metals industry, led by basic steel, reduced third-quarter '60 spending plans 52 pct compared to the second quarter. This drop greatly exceeded that of the same period in 1959, and fell way below 1958 when primary metals increased second - to - third quarter appropriations.

The most encouraging sign in second-to-third quarter comparisons came from the transportation equipment industry. It increased new appropriations in the third quarter 29 pct above the second.

Combined with a minor drop of only 4 pct compared with third-quarter 1959, the second-to-third quarter boost in new appropriations by transportation equipment makers makes the outlook for capital

(continued on p. 42)

Calling the Downturn in Capital Spending



Sources: Metalworking Appropriations: IA-NICB Data Expenditures: SEC Data-Durable Goods Mfg. less stone, clay, glass and misc.

New Tool for Market Research

■ For companies selling to the industry, the metalworking capital appropriations survey provides a brand new marketing tool.

In metalworking, appropriations usually lead expenditures by nine to twelve months. So, by reporting the capital spending plans of 39 different metalworking industries, the survey pinpoints those which are the best prospects for future capital goods orders.

Not only that, but armed with this information, it is possible for a capital goods maker to build a demand forecast for capital equipment by the industries served by his company.

Simply, here's how this works:

Let's say a machine tool builder sells primarily to five three-digit SIC groups: Engine and turbine manufacturers (351); construction, mining and handling machinery (353); pump and ventilating equipment makers (356); automotive and marine engines (371,373).

New spending plans of these five industries for the past three quarters (contained in the appropriations table for nonelectrical machinery (SIC 35) on p. 45), are as follows:

SIC Code	Reported Appropriations ($ Millions) I	II	III
351	$10.0	$ 5.0	$ 4.6
353	46.4	5.8	3.6
356	28.5	8.1	7.9
371	122.9	99.4	132.1
373	4.3	2.5	5.3

These figures come from individual companies in each industry reporting in the survey. The next job, then, is to estimate total appropriations from **all** major companies (500 employees or over) in each industry.

This can be done by dividing each reported appropriations figure by the percent of survey coverage of each industry (shown in column four of the coverage table on p. 46).

For example, the coverage of the engine and turbine group in plants of 500 or more workers is 82 pct. Dividing this into the $4.6 million of new appropriations reported by this industry gives an estimated total of $5.6 million. Calculations for all five groups are shown below:

SIC Code	Coverage Ratio, Pct	Estimated Appropriations ($ Millions) I	II	III
351	82 Pct	$12.1	$ 6.1	$ 5.6
353	70	66.3	8.3	5.1
356	67	42.5	12.2	11.8
371	86	140.3	115.6	153.6
373	50	8.6	5.0	10.6

With this information in hand, let's suppose that the company's percent of total sales to these five industries break down in this order: 15 pct, 25 pct, 20 pct, 30 pct and 10 pct.

These percentages now become the basis for weighing total estimated appropriations figures for each industry. By multiplying total estimated appropriations by these percentages, individual and total figures on all capital goods spending by these five industries can be obtained.

Since about 75 pct of all capital goods dollars appropriated by metalworking companies is spent for equipment, the machine tool builder can tell how much money has been earmarked for future capital equipment spending by customers in the five industries. The figures below, less 25 pct, then can be used as a more specific guide to capital equipment spending plans of the company's customers:

SIC Code	Order Weights, Pct	Total Order Pool ($ Millions) I	II	III
351	15 Pct	$ 1.8	$ 0.9	$ 0.8
353	25	16.6	2.1	1.3
356	20	8.5	2.4	2.4
371	30	42.1	34.7	46.1
373	10	0.9	0.5	1.1
Total Order Pool	100 Pct	$69.9	$40.6	$51.7

Pct Changes in Appropriations

	Second to Third Quarter			
	1957	1958	1959	1960
TOTAL METALWORKING[1]	—53 Pct	+23 Pct	—16 Pct	—18 Pct
Primary metals	—63	+87	—29	—52
Fabricated metal products	—11	+30	+10	—10
Machinery (except electrical)	—63	— 3	+18	+13
Electrical machinery	—25	—26	+26	—28
Transportation equipment	—44	— 8	—29	+29
Instruments	— 5	+26	—45	+ 5

[1] Includes metal furniture, SIC 25, not shown separately.

(continued from P. 40)

spending by this industry look good.

Other Advances — Similarly, instruments manufacturers showed a gain of 5 pct in new appropriations approvals from the second to third quarter this year.

The nonelectrical machinery industry also raised new third-quarter appropriations over the second.

Back Down — Backing off from the huge outlays for new plants and equipment in recent periods, the electrical machinery industry lowered third quarter spending sights 28 pct under the second quarter.

Along with a 60 pct cutback from third-quarter 1959, these third-quarter figures show the industry plans to reduce future capital investment substantially.

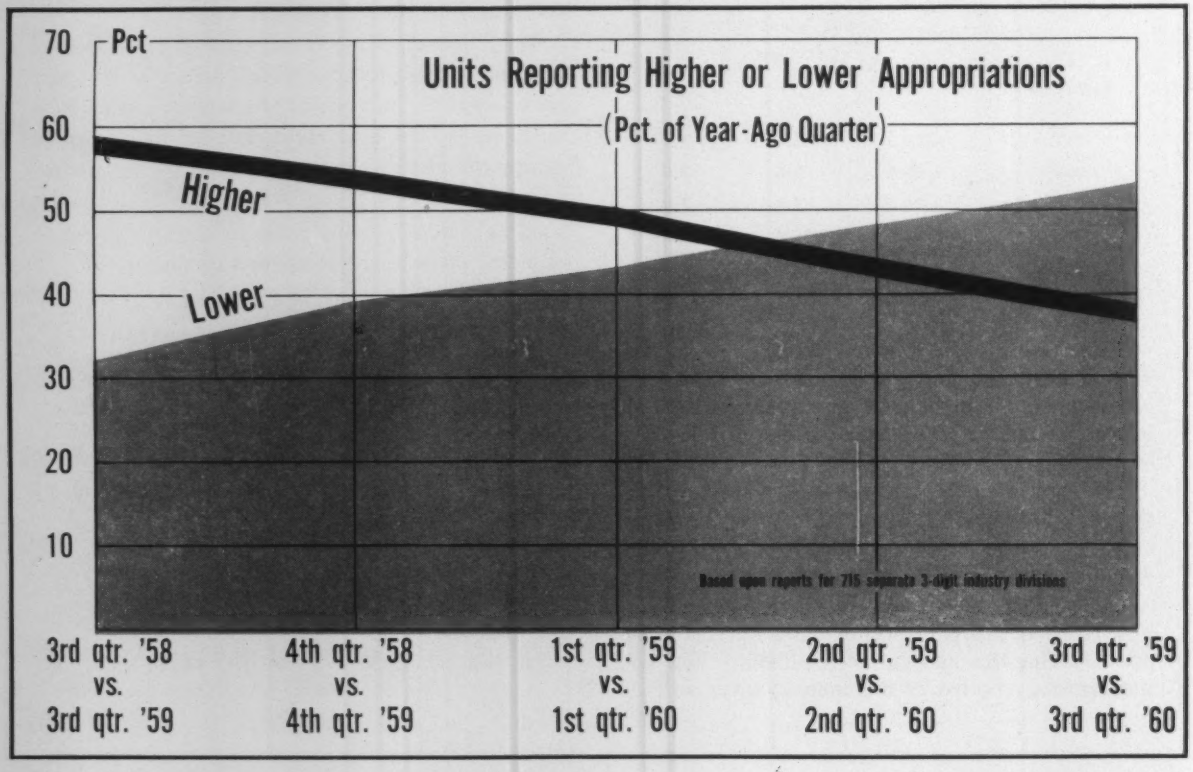
Changes in metalworking capital appropriations from the second to third quarter for the past four years are shown in the table, left.

Momentum Slows—Most important in this survey of new quarterly capital appropriations by metalworking companies is the momentum with which they raise or lower appropriations. The chart below traces the rate of new appropriations reported by groups covering 715 SIC codes in metalworking.

You'll notice that since the third quarter rate of 1959, higher appropriations reported by these groups has declined steadily. On the other hand, the number reporting lower appropriations has gained.

The two trend lines crossed in the second quarter of this year. In this most recent third-quarter survey, the rate continued downward.

New Appropriations Rate Falls Steadily



Detailed Data Points Up Changes

■ A good part of the value of the metalworking capital appropriations survey lies in its detailed breakdown of the industries within the six major metalworking groups.

While total figures can be used to gage the overall direction of future capital goods spending, they cannot be used to detect important changes within these six groups.

On the following two pages, however, you'll find a breakdown of the capital spending plans for some 39 industries within metalworking.

These industries are listed according to the government's Standard Industrial Classification code, on a 3-digit basis. This is the only survey which classifies metalworking industries and their appropriations so precisely.

Back Data — Third quarter spending plans, as well as appropriations for the six major groups dating back to the first quarter of 1959, are given in the table below.

Comparisons between the second and third quarter of 1960; the third quarters of both 1959 and 1960; and the first nine months of each year, are also included in the general table below, and in the detailed tables on the following two pages.

Survey Coverage — The appropriations figures are based on reports from 484 metalworking companies reporting 715 SIC codes. These companies account for over 1,200 major metalworking plants employing 500 or more production workers. Based on plant employment, they represent over two thirds of the metalworking industry's buying power.

The extent of the survey's coverage of each of the 39 metalworking industries is shown in the table on p. 46.

Here you will also find data on the amount of dollar appropriations per worker by each of the 39 industries. This data is particularly useful to metalworking companies for comparing their own capital spending programs with all metalworking and others in their own industry.

Show Up Changes—An analysis of the detailed tables on the following two pages turns up changes in capital spending plans which could not be detected from the broader, 2-digit appropriations figures for the six major metalworking groups.

For example, the primary metals industry (SIC 33) as a whole cut new appropriations in the third quarter 52 pct below the second. However, this figure does not show the steeper, 69 pct cutback by the basic steel industry (SIC 331).

Foundries Gain — More importantly, it does not reveal the 38 pct second-to-third quarter '60 appropriations gain registered by iron and steel foundries (SIC 332).

This group also boosted its new third-quarter appropriations 84 pct above third-quarter 1959. For the first nine months of 1960 it ran 54 pct ahead of the same period in 1959.

While the dollars spent by the basic steel industry for capital goods towers over the amounts spent by ferrous foundries, it is an important distinction for those companies selling capital equipment to either or both industries.

Nonferrous Trend — Also, nonferrous foundries followed the same spending trend as basic steel, rather

(continued on p. 46)

Major Metalworking Groups

Industry	SIC Code	Capital Appropriations—$ Millions 1959 1st Qtr.	1959 2nd Qtr.	1959 3rd Qtr.	1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	Pct Change 3rd Qtr. 1960 over 2nd Qtr. 1960	Pct Change 3rd Qtr. 1960 over 3rd Qtr. 1959	Pct Change 1st 9 mos. 1960 over 1st 9 mos. 1959
Metal Furniture	25	$1.6	$9.2	$1.6	$1.5	$1.6	$2.7	$3.0	+10 Pct	+82 Pct	−42 Pct
Primary Metals	33	544.2	252.1	179.3	379.0	265.1	229.9	109.4	−52	−39	−38
Fabricated Metal Products	34	44.3	37.1	40.8	69.5	54.2	32.8	29.4	−10	−28	− 5
Machinery (exc. Electrical)	35	142.9	107.9	126.9	129.4	147.9	61.5	69.7	+13	−45	−26
Electrical Mach. & Equip.	36	62.7	95.7	120.2	74.0	91.0	66.8	48.3	−28	−60	−26
Transportation Equipment	37	168.2	235.1	167.9	157.7	191.4	125.6	161.9	+29	− 4	−16
Instruments, etc.	38	15.4	14.8	8.1	10.9	16.1	13.4	14.2	+ 5	+76	+14
Total Reported[1]		979.2	751.9	644.7	822.1	767.4	532.7	435.9	−18	−32	−27
Total Estimated for All Metalworking[2]		$1,470	$1,170	$1,010	$1,340	$1,210	$840	$660	−22 Pct	−35 Pct	−26 Pct

Based upon returns from 485 companies reporting 715 separate industry groups.
[1] Excludes ordnance and accessories, SIC Code 19, and miscellaneous manufacturing, SIC Code 39.
[2] Estimated for entire metalworking universe. This includes metalworking firms operating at least one plant employing 500 or more production workers in 1957. See coverage table, page 46.
Source: The National Industrial Conference Board.

Primary Metal Industries

Industry	SIC Code	Capital Appropriations—$ Millions 1959 1st Qtr.	1959 2nd Qtr.	1959 3rd Qtr.	1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	Pct Change 3rd Qtr. 1960 over 2nd Qtr. 1960	Pct Change 3rd Qtr. 1960 over 3rd Qtr. 1959	Pct Change 1st 9 mos. 1960 over 1st 9 mos. 1959
Blast Furnaces, Steel Wks. & Rolling Mills	331	$464.2	$184.0	$113.2	$331.7	$191.2	$140.3	$43.5	−69 Pct	−62 Pct	−51 Pct
Iron & Steel Foundries	332	10.0	8.2	8.9	8.5	13.3	12.0	16.5	+38	+84	+54
Primary Smelt. Nonferrous Metals	333–334	31.9	28.4	33.0	17.5	17.4	21.4	19.3	−10	−41	−38
Rolling, Drawing, Extruding Nonferrous	335	33.9	25.3	13.6	16.0	29.1	51.9	26.3	−49	+94	+48
Nonferrous Foundries	336	0.8	3.8	7.3	1.9	4.7	2.4	1.1	−53	−85	−31
Misc. Primary Metals	339	3.3	2.5	3.2	3.4	9.4	2.0	2.7	+33	−18	+55
Total	33	$544.2	$252.1	$179.3	$379.0	$265.1	$229.9	$109.4	−52 Pct	−39 Pct	−38 Pct

[1] Includes secondary nonferrous smelters, SIC 334.

Fabricated Metal Products

Industry	SIC Code	Capital Appropriations—$ Millions 1959 1st Qtr.	1959 2nd Qtr.	1959 3rd Qtr.	1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	Pct Change 3rd Qtr. 1960 over 2nd Qtr. 1960	Pct Change 3rd Qtr. 1960 over 3rd Qtr. 1959	Pct Change 1st 9 mos. 1960 over 1st 9 mo 1959
Metal Cans	341	$12.0	$12.8	$9.6	$16.2	$22.2	$9.3	$6.5	−30 Pct	−32 Pct	+10 P
Cutlery, Tools, Hardware	342	3.1	2.5	10.7	29.6	3.2	3.1	8.8	+185	−18	− 7
Heating Apparatus (exc. Elec.)and Plumbing Fixtures	343	4.1	2.6	3.4	3.8	3.7	4.3	3.2	−27	− 8	+10
Fabricated Struct. Products	344	6.6	6.7	6.0	9.9	15.0	4.2	3.2	−25	−47	+16
Screw Products & Rivets	345	1.9	3.8	2.3	3.7	2.1	1.3	1.1	−17	−53	−54
Stampings	346	12.4	4.4	6.2	3.0	2.6	6.4	3.6	−43	−41	−45
Coating, Engraving; Misc. Fabr. Wire Prod.	347, 348	0.7	1.4	0.3	0.9	1.9	0.6	0.4	−37	+16	+17
Miscellaneous Fabricated Metal Products	349	3.4	2.8	2.2	2.6	3.5	3.5	2.6	−27	+20	+14
Total	34	$44.3	$37.1	$40.8	$69.5	$54.2	$32.8	$29.4	−10 Pct	−28 Pct	− 5 Pct

Transportation Equipment

Industry	SIC Code	Capital Appropriations—$ Millions 1959 1st Qtr.	1959 2nd Qtr.	1959 3rd Qtr.	1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	Pct Change 3rd Qtr. 1960 over 2nd Qtr. 1960	Pct Change 3rd Qtr. 1960 over 3rd Qtr. 1959	Pct Change 1st 9 mos. 1960 over 1st 9 mos. 1959
Motor Vehicles & Equip.[1]	371–5–9	$99.5	$190.9	$127.6	$100.0	$122.9	$99.4	$132.1	+33 Pct	+ 4 Pct	−15 Pct
Aircraft & Parts	372	60.1	41.4	34.5	54.9	61.5	21.7	23.8	+10	−31	−21
Ship & Boat Building	373	6.4	1.3	2.7	1.6	4.3	2.5	5.3	+108	+93	−14
Railraod Equipment	374	2.1	1.4	3.1	1.2	2.7	1.9	.8	−59	−74	−19
Total	37	$168.2	$235.1	$167.9	$157.7	$191.4	$125.6	$161.9	+29 Pct	− 4 Pct	−16 Pct

[1] Includes motorcycles, bicycles and parts, and miscellaneous transportation equipment.

Electrical Machinery

Industry	SIC Code	Capital Appropriations—$ Millions 1959 1st Qtr.	1959 2nd Qtr.	1959 3rd Qtr.	1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	Pct Change 3rd Qtr. 1960 over 2nd Qtr. 1960	Pct Change 3rd Qtr. 1960 over 3rd Qtr. 1959	Pct Change 1st 9 mos. 1960 over 1st 9 mos. 1959
Elec. Transmission Equip.	361	$8.3	$14.1	$56.4	$15.1	$10.1	$13.8	$4.6	−67 Pct	−92 Pct	−64 Pct
Elec. Indus. Apparatus	362	9.0	25.7	7.3	11.4	17.2	8.2	11.9	+46	+64	−11
Household Applicances	363	8.7	10.6	6.1	4.4	7.2	5.1	5.1	− 1	−17	−32
Electric Lighting & Wiring Equipment	364	2.8	5.4	3.1	6.7	6.6	11.4	3.2	−72	+ 5	+89
Radio & TV Receivers	365	1.4	4.2	5.8	2.4	3.2	1.9	3.4	+76	−42	−25
Communication Equipment	366	10.1	10.1	28.6	14.7	13.1	3.3	10.0	+198	−65	−46
Electronic Components	367	21.1	23.2	11.6	18.3	32.7	22.5	8.6	−62	−26	+14
Misc. Electrical Equipment	369	1.3	2.4	1.4	1.0	0.9	0.6	1.5	+136	+ 8	−41
Total	36	$62.7	$95.7	$120.2	$74.0	$91.0	$66.8	$48.3	−28 Pct	−60 Pct	−26 Pct

Nonelectrical Machinery

Industry	SIC Code	Capital Appropriations—$ Millions 1959 1st Qtr.	1959 2nd Qtr.	1959 3rd Qtr.	1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	Pct Change 3rd Qtr. 1960 over 2nd Qtr. 1960	Pct Change 3rd Qtr. 1960 over 3rd Qtr. 1959	Pct Change 1st 9 mos. 1960 over 1st 9 mos. 1959
Engines & Turbines	351	$23.3	$7.0	$5.9	$23.6	$10.0	$5.0	$4.6	− 8 Pct	−23 Pct	−46 Pct
Farm Machinery & Tractors	352	18.9	14.2	11.8	12.9	10.5	7.7	7.2	− 6	−39	−44
Construction, Mining, Handling Equipment	353	33.8	27.5	11.3	12.4	46.4	5.8	3.6	−37	−68	−23
Metalworking Machinery & Equipment[1]	354–359	8.5	6.6	11.2	6.2	13.5	5.1	6.9	+36	−38	− 3
Special Indus. Machinery	355	9.6	5.4	9.2	8.7	9.4	10.8	7.1	−35	−23	+13
General Ind. Machinery & Equipment	356	25.5	16.2	37.1	15.7	28.5	8.1	7.9	− 2	−79	−44
Office & Store Machines	357	21.0	27.7	35.6	46.9	26.5	15.6	27.2	+74	−24	−18
Service Industry Machines	358	2.4	3.1	4.8	3.0	3.1	3.5	5.3	+50	+11	+16
Total	35	$142.9	$107.9	$126.9	$129.4	$147.9	$61.5	$69.7	+13 Pct	−45 Pct	−26 Pct

[1] Includes miscellaneous, nonelectrical machinery, SIC Code 359.

Instruments

Industry	SIC Code	Capital Appropriations—$ Millions 1959 1st Qtr.	1959 2nd Qtr.	1959 3rd Qtr.	1959 4th Qtr.	1960 1st Qtr.	1960 2nd Qtr.	1960 3rd Qtr.	Pct Change 3rd Qtr. 1960 over 2nd Qtr. 1960	Pct Change 3rd Qtr. 1960 over 3rd Qtr. 1959	Pct Change 1st 9 mos. 1960 over 1st 9 mos. 1959
Laboratory, Scientific & Engineering Instruments	381	$5.3	$4.7	$2.5	$4.7	$5.1	$4.8	$4.9	+ 1 Pct	+92 Pct	−15 Pct
Measuring & Controlling Instruments	382	6.2	7.8	3.6	3.6	5.2	6.1	3.5	−43	− 3	−16
Other[1]	383–387	3.9	2.3	1.9	2.6	5.7	2.5	5.8	+130	+203	+73
Total	38	$15.4	$14.8	$8.1	$10.9	$16.1	$13.4	$14.2	+ 5 Pct	+76 Pct	+14 Pct

[1] Includes optical instruments, surgical instruments, ophthalmic goods, photographic equipment and watches, clock-operated devices, SIC Codes 383, 384, 385, 386, 387.

(continued from p. 43)

How Survey Covers Metalworking

All companies in the industries listed below, with plants of 500 or more plant workers were queried. They account for about two-thirds of the total employment and buying power in the metalworking industry. The fourth column shows the percentage of production workers employed by the companies cooperating in this survey. The last column shows appropriations per production worker.

Industry and SIC Code	Production Workers, Thousands	Production Workers, Thousands	Pct of Total Employment	Appropriations per Production Worker,[1] $
	Companies With Plants of 500 or more	Cooperating Companies	Cooperating Companies	
Metal Furniture, 251, 252, 253, 254, 259	31	12	38 Pct	$750
Blast Furnaces, Steel Works, Rolling Mills, 331	595	313	53	2,255
Iron and Steel Foundries, 332	81	61	75	824
Primary & Secondary Smelting, Nonferrous, 333, 334	54	50	92	1,519
Rolling, Drawing, Extruding, Nonferrous Metals, 335	114	80	71	1,533
Nonferrous Foundries, 336	19	13	67	805
Misc. Primary Metals, 339	37	22	59	796
Metal Cans, 341	47	45	95	1,215
Cutlery, Hand Tools, Hardware, 342	54	35	65	1,260
Heating Apparatus (except elec.) & Plumb. Fixtures, 343	34	21	61	715
Fabricated Struct. Prods., 344	60	30	50	1,075
Screw Prods. & Rivets, 345	26	15	60	532
Stampings, 346	65	43	67	362
Coating, Engraving; Miscellaneous Fabricated Wire Products, 347, 348	21	10	47	389
Mis. Fab. Metal Prods., 349	54	36	66	344
Engines & Turbines, 351	71	58	82	740
Farm Mach. & Tractors, 352	60	34	56	1,127
Construction, Mining Handling Equipment, 353	111	78	70	872
Metalworking Machinery & Equipment, 354, 359	105	64	61	494
Special Industry Mach., 355	47	22	48	1,608
General Industrial Machinery & Equipment, 356	92	62	67	971
Office & Store Machines, 357	78	58	74	2,018
Service Ind. Machines, 358	38	22	59	663
Elec. Trans. Equip., 361	90	49	54	896
Elec. Ind. Apparatus, 362	134	65	48	753
Household Appliances, 363	96	46	48	470
Electric Lighting & Wiring Equipment, 364	55	30	54	936
Radio & TV Receivers, 365	71	27	38	404
Communication Equip., 366	113	52	46	800
Electronic Components, 367	95	62	65	1,325
Misc. Elec. Equipment, 369	27	8	30	492
Motor Vehicles & Equip., 371, 375, 379	648	558	86	815
Aircraft & Parts, 372	522	481	92	337
Ship & Boat Building, 373	61	31	50	446
Railroad Equipment, 374	43	26	61	252
Laboratory, Scientific & Eng. Instruments, 381	41	16	39	1,231
Measuring & Controlling Instruments, 382	41	26	64	705
Other, 383, 384, 385, 386, 387	77	20	26	822
Total	4,008	2,681	67 Pct	$954

* Based upon returns from 485 companies reporting 715 individual industry codes. Employment figures based on Iron Age Census data, 1957. Figures in last column calculated from unrounded data. Over 1200 plants with 500 or more production workers reported.

[1] In dollars per production worker, based on appropriations made from first quarter 1959 through third quarter 1959 and plant employment of reporting companies in 1957.

SOURCE: The National Industrial Conference Board.

than that of steel foundries.

This industry (SIC 336) cut third quarter appropriations 85 pct below third-quarter '59, and 53 pct below the previous quarter. For the first nine months of 1960 it fell 39 pct behind nine-months '59.

The nonelectrical machinery industry (SIC 35) showed a third-quarter decline in new appropriations from third-quarter 1959.

But the surprising strength in new appropriations by makers of service industry machines (SIC 358) is not apparent from 2-digit data.

Office Machines Up—Service industry machine manufacturers raised new appropriations 50 pct from the second quarter.

Without these detailed figures, unnoticed too, might go a second-to-third quarter gain of 74 pct by office machinery manufacturers.

In the electrical machinery field (SIC 36), the sharpest reductions on a year-to-year basis took place in electrical transmission equipment, radio and TV receivers and communications equipment.

However, signs of new strength were shown by manufacturers of electrical industrial apparatus.

Auto Strength—The transportation industry as a group boosted new appropriations 29 pct from the second to the third-quarter and dropped them only 4 pct under third-quarter 1959. Responsible for this sound, overall picture are automotive and shipbuilding.

Automakers posted second-to-third quarter appropriations gains of 33 pct and kept new appropriations 4 pct above third-quarter 1959. Shipbuilders increased their totals 93 pct above 1959's third-quarter and 108 pct from second-to-third quarter 1960.

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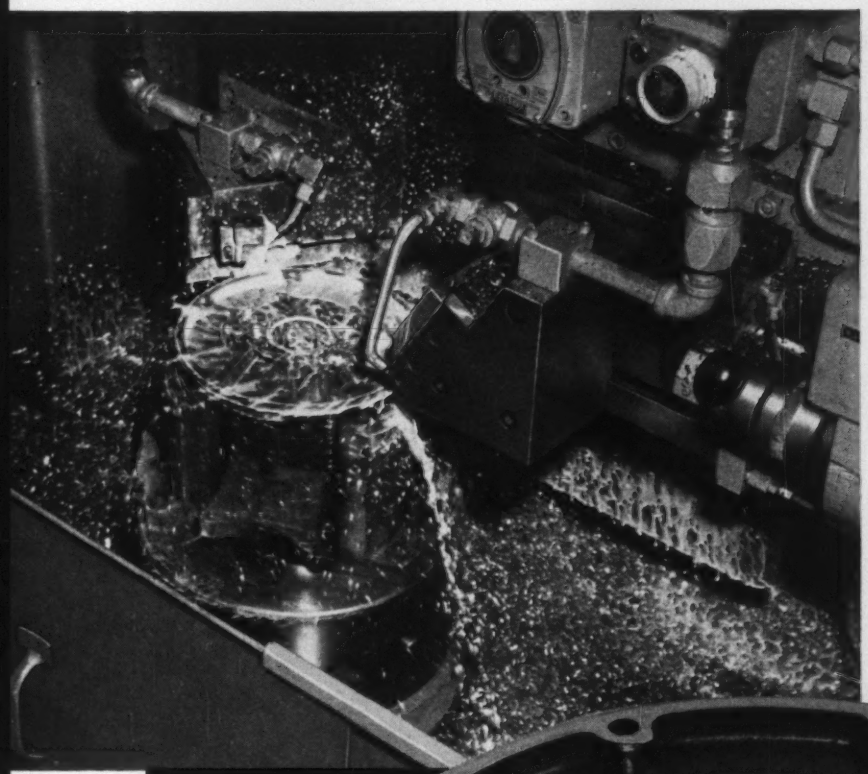

It takes a machine tool with real "guts" to stand the shock of hour-after-hour high speed production on a tool-shattering interrupted cut like this. Special work-holding fixtures were attached to the spindles to automatically locate and clamp the automotive part solidly.

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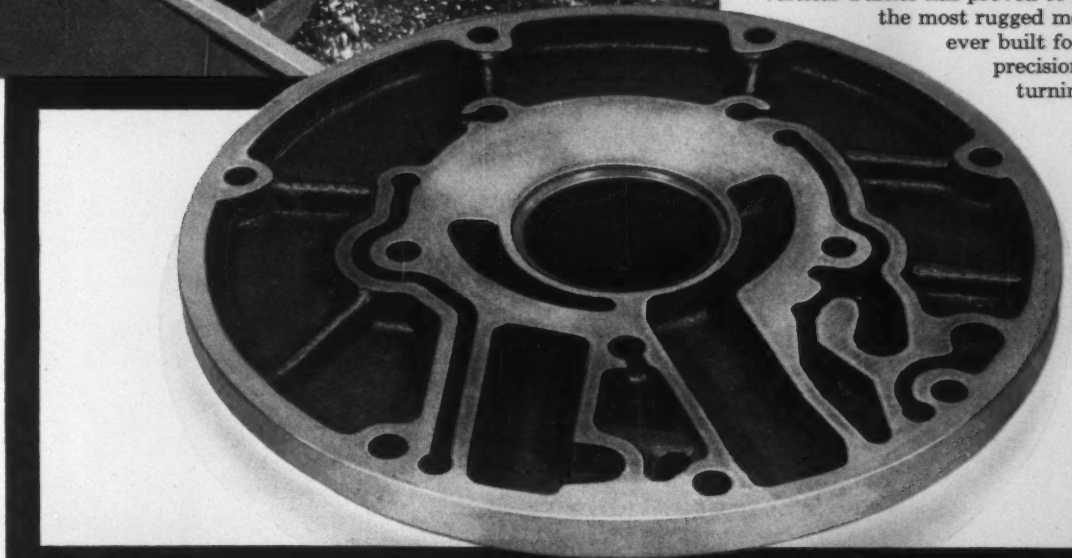

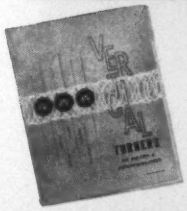

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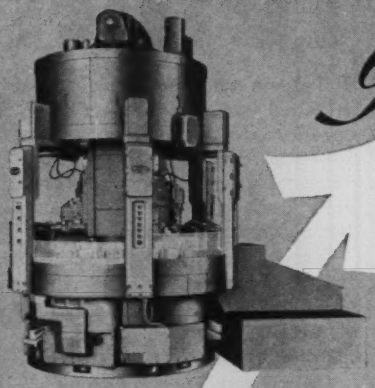

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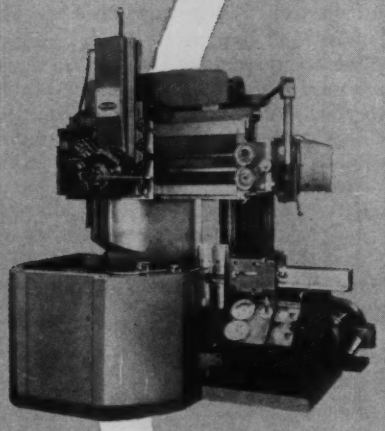

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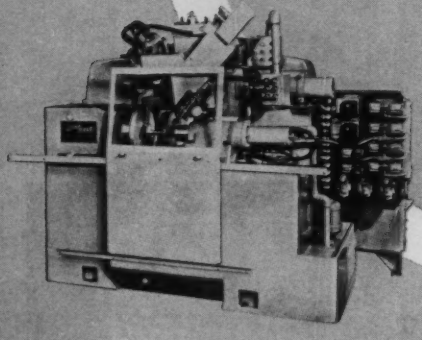

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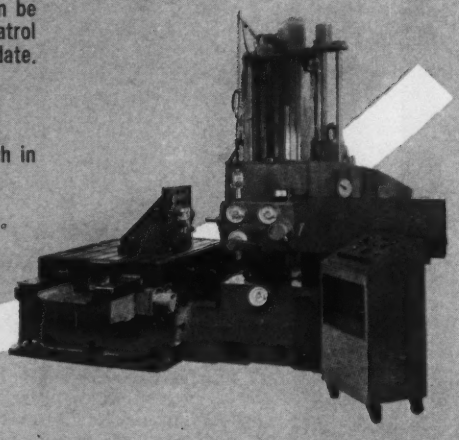


Auto Buyers Demand Variety

Compacts have just started to fulfill the desires of the public for special vehicles.

The customer's hunger for variety means additional production problems.
By A. E. Fleming

■"A major problem facing the automotive industry is customer demand for an even greater variety of sizes and shapes of vehicles," says J. O. Wright, vice president of Ford Motor Co.'s car and truck group.

"Compact cars already on the market have been favorably received. But far from filling the public's appetite for special vehicles, they seem to have only whetted it."

The public hunger for variety—as evidenced by the continued popularity of many big cars, the surge of the compacts, and the near-future arrival of smaller models—is putting an unprecedented premium on flexibility in manufacturing and assembling operations.

Volume and Variety—As automakers see it, there never was a time when it was more necessary to make and deliver so many different types of cars and engines in volume.

Mr. Wright points out, "We're investing substantial sums in the redesign of machines and facilities which in the past have been dedicated to the production or assembly of a single product. This is done so that they may be used in the future for production or assembly of more than one product."

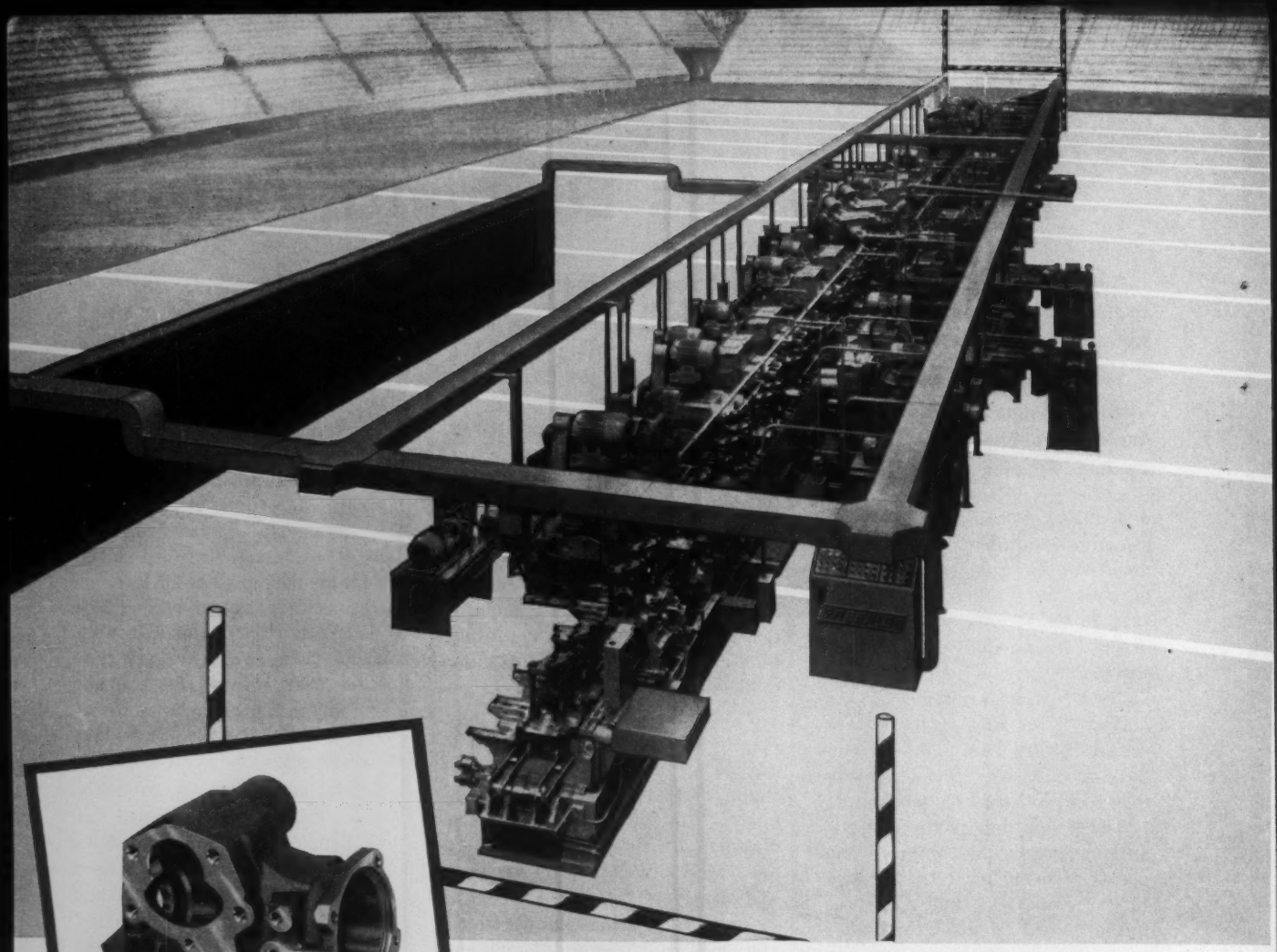
He cites four metal stamping plants, for example, where certain presses formerly could be used to stamp parts for only one line of cars. "Now all parts have been classified by design groups which are largely determined by the sizes and shapes of the parts," he says. "Presses have been redesigned so one die can be removed and another put in its place quickly. If the volume for one line of cars falls below planned production, it's easy to use machines which formerly would have been idle to stamp parts for some model whose acceptance is greater than we expected."

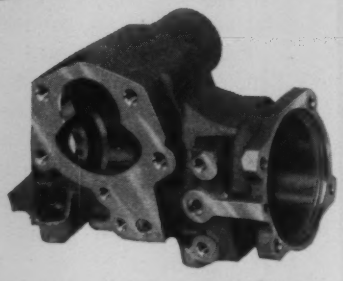
Engine Making Too — Engine making is another example of the effort to reduce differences in product components and boost adaptability of machine tools. Ford makes two six-cylinder engines for its compacts, one 144.3 cu in., another 170 cu in. Within the company's total capacity, Ford is able to vary production levels between the two engines on the same machines by as much as 200,000 units, depending on which engine proves popular.

The same is true in assembly plants. They're being tooled so more than one kind of car can be made on the same production line. Only last week, Ford's Atlanta plant, down a month for reconversion, began turning out Falcons and Fords on the same line.

There's a Bright Future Ahead for Night Driving

LIGHT DRIVING: Translucent tires with lights inside produce swirls of light in front of The Goodyear Tire & Rubber Co., Akron. The experimental tires, made of a synthetic rubber called Neothane, were developed to test the building of tires without the cord usually necessary for shape and strength.





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Ed: This looks good to me - let's discuss it - JB.

New Report Scores Tax Laws

Present Taxes are Block to Needed Jobs, Tools

New report on depreciation by Fordham U. economist claims tax reform in this area is a prime national need.

Swelling worker ranks demand more production, more tools. Foreign threat is real.
By R. H. Eshelman

■ Present tax write-off laws are more than a business problem. They are a national problem.

This idea is the premise of a just-issued study called, Economic Depreciation and Employment in the 1960's. The 32-page study is the work of priest-economist, the Rev. William T. Hogan, S.J., director of the Industrial Economics Program at Fordham U. Co-author of the analysis is Frank Koelble, an associate of Father Hogan at the university.

Employment Tie-in — Depreciation laws are a national concern because of their affect on employment, says Father Hogan. He points out that unemployment is now at a 20-year high. Yet business, and the nation, must meet the problem of making jobs for a work force that will swell to 87.1 million by 1970. This is a jump of 13.5 million workers from the present level.

Stating the role of tax laws in the employment picture, Father Hogan says, "The total solution will require a number of changes and adjustments, one of which is liberalization of present depreciation allowances so that the true cost of wear and tear on capital equipment can be written off before taxes.

"Thus the tax system will be geared to encourage investment, which is the basic stimulant to economic activity and employment growth. However, growth must be preceded by modernization of existing facilities in order to keep our industrial plant in balance."

High Obsolescence—The authors contend that nearly one-third of U. S. production plant and equipment is obsolete. They add: "Should the present depreciation-tax system be maintained, at least an additional $60 billion worth of our plant and equipment will grow obsolete by 1970. The $96 billion required at the present time for modernization, added to the $60 billion, demonstrates our crucial need for capital to replace obsolete equipment."

These figures do not take into account the capital needed for expansion to provide the tools for the additional 13.5 million workers in the next ten years.

Swelling Work Force—Say the economists: "By 1970, if twice as many new workers are to be engaged in an equally efficient manner, technological development will have to proceed that much faster."

Father Hogan, in his study, shows how foreign competition aggravates the problem of unrealistic U. S. tax laws. He cites the liberal write-off allowances of foreign countries.

They see automation as, "nothing more than a continuation of a process which over the years has fostered increased employment."

Versatile Broach Goes to Work

BIG BROACH JOB: T-shaped hole 8 in. wide by 14.5 in. long is broached in two operations in 800 lb breech ring body here being readied for machining. Ex-Cell-O Corp.'s Continental Tool Works made the broach.

Cure Suggested for Economy

A Labor Economist Urges a 10-Year Building Plan

A labor economist, Stanley H. Ruttenberg, says a huge 10-year building program could lift the U. S. economy.

He made his suggestion recently at the AFL-CIO California labor education conference.
By R. R. Kay

■ A leading labor economist offers a "prescription for economic growth."

To lift the economy, Stanley H. Ruttenberg, AFL-CIO research director, urges a huge 10-year building program. It calls for urban development, schools, increased transit facilities, and hospitals.

Mr. Ruttenberg spoke in San Francisco recently, before the California labor education conference, AFL-CIO. The nation must act now to fill its "greatest unmet social needs," the labor leader contends. He says such outlays would boost the gross national product as well as the income of the people.

Mr. Ruttenberg also notes that no tax hike should be necessary to finance this vast building program and it would mean a market for a lot of metalworking goods.

More Tax Money—"For every $5 of volume we improve production, the government collects an additional dollar in taxes."

But if some "deficit financing" is needed, he feels it would be justified in view of four U. S. recessions since 1949.

Leon Keyserling, chief economic adviser to former President Harry S. Truman, also spoke to the California labor gathering.

More Declining — He predicts that the economy is in for a further decline before its gets any better. He feels the country is now in the grip of a "full blown recession."

His proposal: A tax cut in the lower income brackets to boost purchasing power and give business a stimulant. He argues that the income lost by the tax cut could easily be offset by plugging loopholes in present tax laws.

Mr. Keyserling is against any tax increase. It would only repress business and further hamper industrial expansion and development of new jobs.

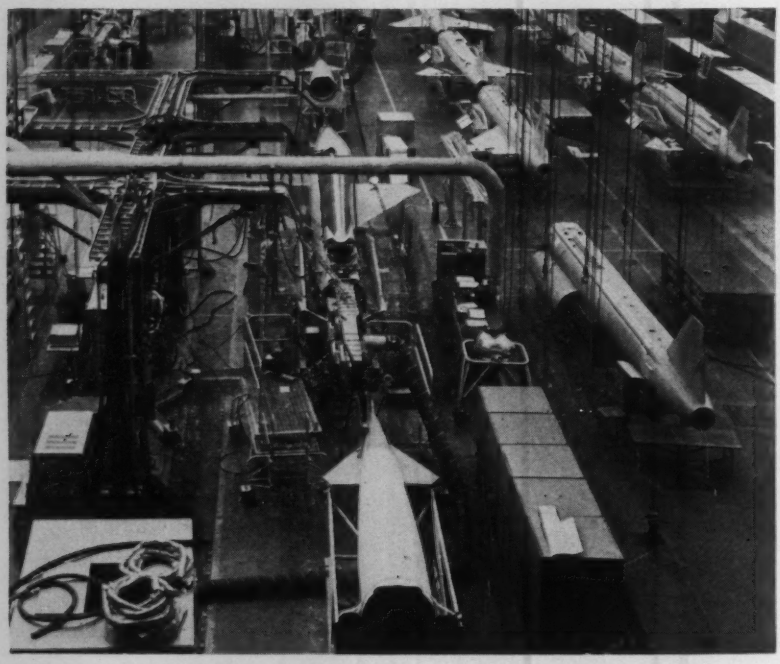
Behind the Times—If organized labor is to stop a decline in strength and prestige, it must update its thinking. That's the word James Stern, United Auto Workers' economist, brought to the conference.

"There are enough foreseeable changes in the labor force composition in the 1960's, and enough changes in technology to require unions to re-examine their programs and policies.

"Let's face it. Unions are going to have to do a better job in organizing."

He urges special emphasis on recruiting white-collar workers. In the past ten years, this group has doubled.

'Backstage' With SAC's Missiles



HOUND DOGS: The Strategic Air Command's GAM-77 Hound Dog missiles are shown for the first time on North American Aviation, Inc.'s, production line. Air Force has ordered several hundred of the missiles.

E. F. Buryan, elected president, chief executive officer and member of the board, Minneapolis-Moline Co., Hopkins, Minn.

Hewitt-Robins, Inc. — **H. M. Ross,** elected a vice president; **Martin Vander Laan,** appointed director, engineering sales; **N. M. Godfrey,** named manager, Robins Conveyors Div., Passaic, N. J.

Air Products, Inc. — **J. J. Laputka,** elected financial vice president.

Crucible Steel Co. of America—**J. H. Buerger, Jr.,** appointed asst. to the vice president-commercial.

U. S. Steel Corp.—**J. W. Ramsey, Jr.,** appointed general manager, traffic.

National Tube Div., U. S. Steel Corp.—**A. W. Thornton,** appointed director, engineering and research.

Stromberg-Carlson Div., General Dynamics Corp.—**G. J. Dickey,** appointed vice president and asst. general manager.

Rocketdyne, Div. of North American Aviation, Inc.—**E. F. Brown,** named vice president, administration.

Weirton Steel Co., Div. of National Steel Corp.—**P. C. Schoenfeld,** named manager, coated sheet product sales.

Servo Corp. of America—**J. L. Heins,** named director, defense systems.

Patterson Foundry & Machine Co. (Canada) Ltd.—**Willard Mason,** appointed general manager, and **Robert Cantle,** named sales manager.

U. S. Steel Supply Div., U. S. Steel Corp.—**R. G. Beeson,** appointed product manager, aluminum, Chicago district.

Link-Belt Co.—**E. W. Sacoff,** appointed manager, district sales office, Moline, Ill.

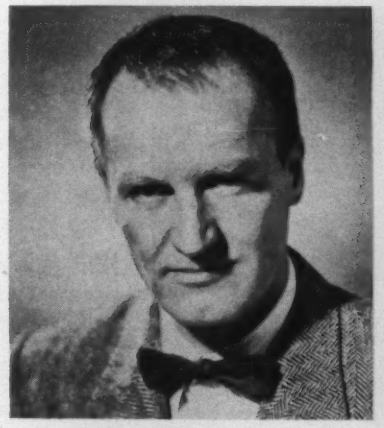
Aluminum Co. of America, Development Div.—**E. T. Wanderer,** appointed development manager, machinery and equipment.

W. L. Fader, appointed general superintendent, National Tube Division's Lorain Works, U. S. Steel Corp.

Morris Machine Works—**J. C. Taliaferro,** appointed manager, hydraulic dredge sales.

The Youngstown Sheet & Tube Co.'s Butt Weld Pipe Mills, Indiana Harbor Works — **J. L. Roemer, Jr.,** appointed superintendent; **J. R. Hanlon, Jr.,** to general foreman, continuous weld furnaces; **Michael Spin,** to general foreman, Continuous Butt Weld Finishing Dept.; **Harry Sutton, Jr.,** general foreman, galvanize and conduit unit.

F. J. Robbins, elected president and chief administrative officer, Bliss & Laughlin, Inc.



H. A. Nunnemacher, elected president, Galland-Henning Manufacturing Co., Milwaukee, Wis.

H. W. Brandt, named vice president and group executive, National Malleable & Steel Castings Co.

CF&I WIRE HELPS PACKAGED for YOUR PRODUCTION

"CF&I Stem-paks cut machine loading time 80%... give us an extra hour of production every day," stated Mr. Frederick Voos, Plant Superintendent, Risdon Manufacturing Co., Waterbury, Conn.

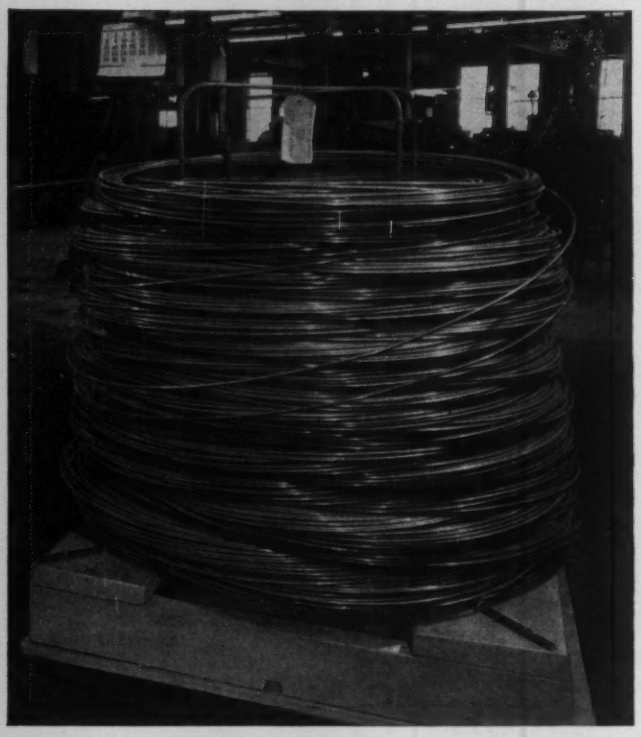
PROBLEM

1. "Our specially designed machines *were* fed wire from coils averaging 150 lbs. Because of the small size, frequent machine loadings were necessary. Each time, the coils had to be loaded by hand and the bindings clipped, after which the wire was guided through the straighteners before entering the machine. We were losing valuable production time due to excessive machine downtime," explained Mr. Voos.

SOLUTION

1. "Our Purchasing Department called a CF&I salesman who carefully examined our operation and recommended that we switch to CF&I Stem-paks which hold up to 1,000 lbs. of one continuous length of wire. Each Stem-pak feeds a machine for an average of one to two days... a production time equal to using seven coils with set-ups in the past.

"Stem-paks give us approximately an extra hour of production per day on each machine," Mr. Voos pointed out. "A Stem-pak can be set up in one-fifth of the time required for the seven coils of wire formerly used... *a saving of 80% on loading time.* The extra hour of production represents a 12½% increase in the operator's production time."



CF&I Stem-paks are delivered on pallets for fast unloading and easy in-plant handling by fork trucks.

PROBLEM

2. "Part of our operation required the use of wire that was free from rust, grease or dirt. Too often, unprotected coils would collect dirt in transit or storage.

SOLUTION

2. "CF&I Fibre Drums are an ideal answer to the problem of unclean wire. The sturdy Fibre Drum has a metal cover and locking band which seals the drum, protecting the wire from grime and from corrosive elements. In addition, Fibre Drums hold up to 600 lbs. of one continuous length of wire which enables us to run our machines for a longer time than when we used small coils."

Stem-paks and Fibre Drums are just two of nine wire packages that CF&I offers to help make your operation more efficient and economical. When you order from

INCREASE PRODUCTION 12½%

at Risdon Manufacturing Co., Waterbury, Conn.

Risdon Mfg. Co. also uses CF&I Fibre Drums, which hold up to 600 lbs. of wire, for special operations. The sealed Fibre Drums protect the wire against rust and contamination during transit and in-plant storage. Note how closely the Fibre Drums can be placed to the machine and how evenly the wire pays off.

A Stem-pak is easily placed in storage alongside Fibre Drums. No messy storage problems... no chance of coils becoming tangled. Inventory of this neat, compact storage set-up is a quick, simple counting job.

CF&I, you can specify wire *packaged for your production* to give you one or more of these benefits:

- **less downtime through extra-long continuous lengths of wire**
- **compact storage and simplified inventory control**
- **fast unloading and in-plant handling**
- **assured cleanliness of the wire**
- **smooth pay off of the wire**

A CF&I salesman will be glad to assist in selecting the *right* wire package for your operation. There's no charge for this service, so call our nearest sales office today.

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

CF&I STEEL

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In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

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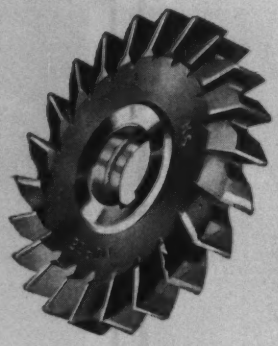

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Whenever you have a cutting tool need—whatever tool problems you encounter—the *first* man to contact is your local Morse-Franchised Distributor. He's the man with "*all* The Mosts" in the cutting tool field—he serves you fastest with the best!

In fact, right now his local stocks are so extensive you can phone him, order the popular Morse tools you need, get them *in hours*. Try it—call your Morse-Franchised Distributor now!

Morse means more production... smoother, more accurate production...with every type of cutting tool from drills, reamers, taps and dies, to end mills, milling cutters, slitting saws and "specials". So, if you want the best from every cutting tool you buy, mark your order "MORSE". For if you want *Morse Quality*, there's only one way to get it...*specify Morse*.

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Faster Air Travel

An 18-month, $1-million research program will establish methods to guide engineers in designing swept-wing areospace vehicles. These vehicles will fly at more than five times the speed of sound. Several four-foot wingspan static and flutter models are scheduled for wind-tunnel tests. Static models are made from heat-treated steel. Flutter wings consist of layers of plastic foam surrounding a magnesium sheet.

Lunar Probe: A Big Hit

Is the moon's surface solid rock or does it have a heavy dust layer? To check this out, one scientist has devised a hard probe to slam into the moon at a velocity of 7700 fps. Just before destruction from the impact, instruments in the tail would radio data back to earth to resolve this very important question.

Deadwood Will Be Dropped

Space-age experts predict that by 1970 the number of different types of aircraft in the defense inventory will be reduced to two. In the next ten years, the total quantity of production will be reduced 50 pct or more. The Air Force, gearing itself for the big shift to missiles and space vehicles, is junking almost 200 of its older jet bombers. Some major air bases are already being placed on the auction block.

Pay Raise for Scientists?

The problem of hiring and keeping skilled scientists and engineers in the Air Force is reaching "dangerous" levels. Air Force research chief, Lt. Gen. Bernard Schriever warns that immediate steps must be taken to keep research and development personnel in the service.

Keeps Minuteman Cool

Cooling systems for the Minuteman are now under construction. These systems are designed to cool temperatures in the guidance compartment to an accuracy of $\pm 0.2°F$. They'll deliver a controlled flow of chilled water to the missile. Water absorbs heat from fan-circulated helium. The helium in turn cools electronic equipment and the guidance system's platform.

Duplicates Human Memory

A major advance in space technology is an electronic neuron that artificially duplicates portions of the human nervous system and simulates human-like learning processes. The neuron virtually duplicates functions of a live nerve cell. It can, in a limited way, remember past experiences and learn new facts under the direction of a human or mechanical teacher.

Simulates Nuclear Blast

Bombarding objects with a gamma-radiation pulse, similar to that produced by an atomic blast, flash-tests electronic devices for missiles. A linear electron machine creates a single high-intensity pulse equal to 10-million volts of gamma radiation. This machine helps to study nuclear-radiation effects on missiles.

Put Satellite in Orbit

Three tiny gyroscopes, weighing only 14 oz each, played key roles in the system that guided the Tiros II satellite into orbit. These gyros, so sensitive that they can measure motion 3000 times slower than a clock's hour hand, were the watchdogs of the flight-control system. The gyro package senses the slightest change in trajectory and instantly pinpoints all deviations.

Steers Missile Defenders

A $300,000 contract has been awarded to Hughes Aircraft Co. to develop a guidance unit for the Mauler air-defense system. This system represents a new class of ground-to-air missiles. The guidance unit will help the Mauler track and destroy attacking aircraft and missiles. It will steer the Mauler through sudden changes of direction to compensate for evasive maneuvers.

CUT GRINDING TIME...IMPROVE FINISH

WITH MIDVAC

Micro Lustre

VACUUM MELTED FINISHING ROLLS

Made from consumable electrode vacuum melted Midvac Steels these rolls offer qualities unsurpassed in cleanliness and ductility by any metal finishing rolls. They have a super uniformity of fine grain structure, maximum freedom from defects and non-metallic inclusions.

Midvac Rolls are precision ground to a deep, black, Micro-Lustre finish... assure rolling of stainless steel, foil and precious metals free of surface imperfections. The super uniformity throughout has resulted in rolls lasting twice as long between grinds. The deep Micro-Lustre grain structure makes it possible to cut grinding time in half.

Improve product quality and get more footage out of every roll — specify Midvac Rolls on your mills. Midvale-Heppenstall also makes forged rolls for rolling steel and non-ferrous metals, paper, plastics and rubber.

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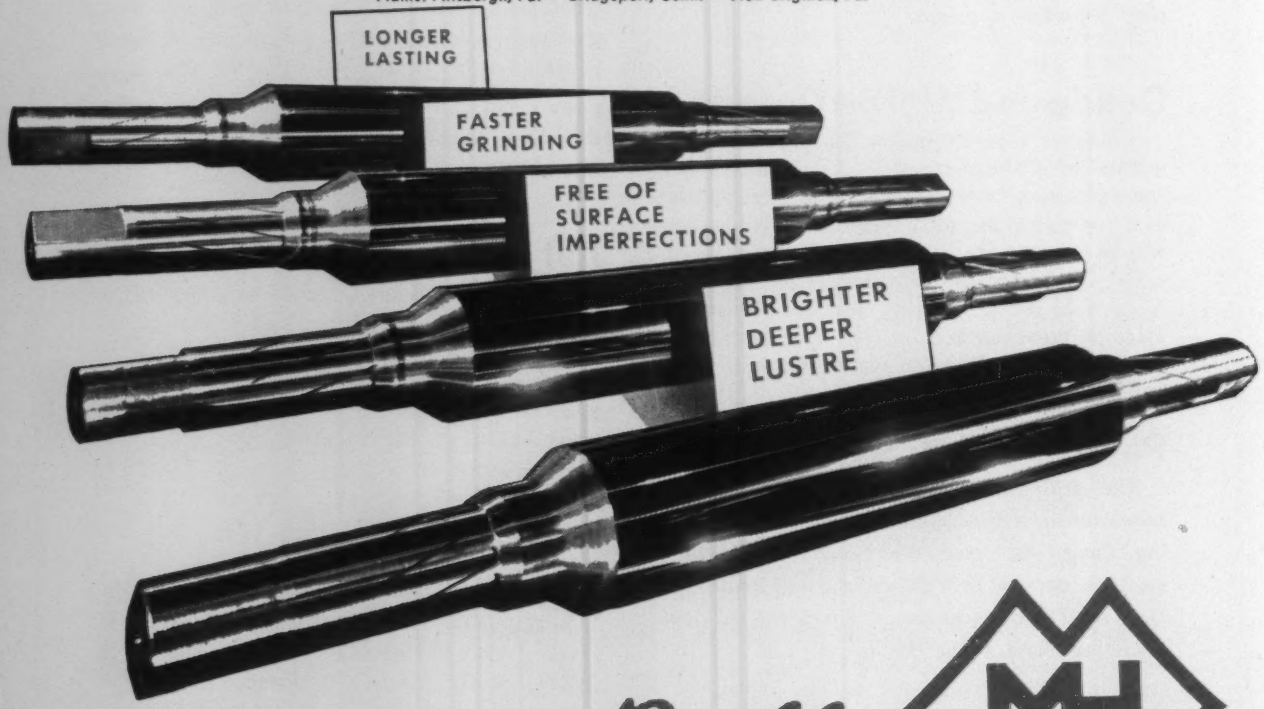


Midvac Rolls

MH

What Factors Influence Design Of Glass-Extruded Steel?

By **J. H. Rice**—Development Engineer and **F. C. Hacket**—Chief Works Metallurgist, Allegheny-Ludlum Steel Corp., Watervliet, N. Y.

Extruding steel takes a little extra care. Glass, for example, is used as a lubricant.

But, attention to process conditions and design criteria will be well worth the effort.

■ The importance of the extrusion process for the aluminum and brass industries is well known. These metals are reputed to be ideal for the process; they have helped formulate most extrusion technology.

However, the wide range of extruded aluminum and brass products may have led to an over-simplification of the problems of the process—particularly with respect to steel.

The variables of the extrusion process vary from one metal to another. For example, lubrication is not important when extruding aluminum. In fact, it's harmful, since it leads to undesirable metal flow. However, lubrication is vital for making acceptable stainless steel extrusions.

How Process Works — Extrusion generally consists of placing a heated billet into a steel container, closed at one end by a die assembly. The other end of the container remains open to admit the ram, attached to a piston.

When the ram contacts the hot billet, pressure develops and causes it to flow continuously through the die to conform to the dimensions of the die opening. Shaped products are made with solid billets. Tubular products are made with a billet having a pre-shaped hole.

When extruding steel and similar metals, non-turbulent metal flow or "streamlined flow" occurs. The metal on the outside surface of the billet flows directly to the outside surface of the product.

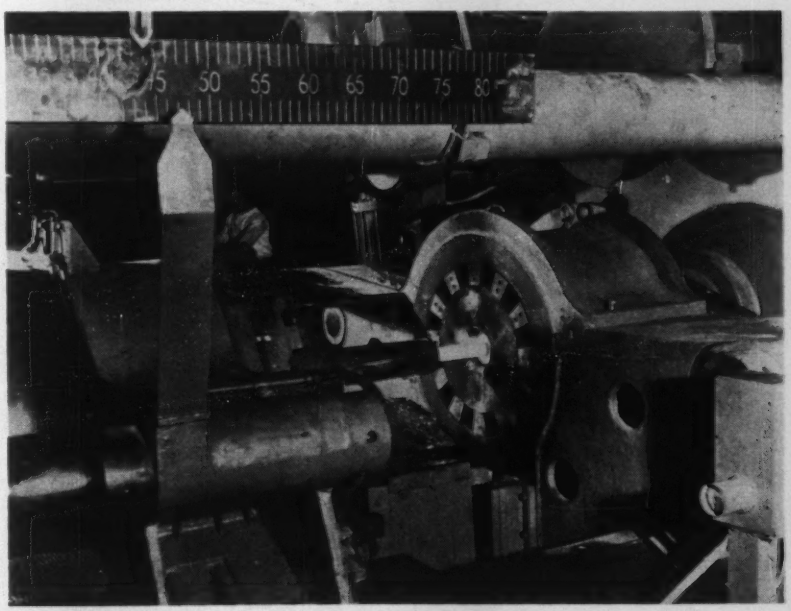
Must Be Heated — To obtain streamline flow, billets must be scale-free heated to temperatures of 2100°-2300°F.

But problems arise at these high temperatures. For example, if steel were to be pushed to cause turbulent flow as is produced in the extrusion of aluminum, dies cannot maintain hardness to hold the sharp die entry needed.

Also, another point to remember is that galling and welding of metals occur in many hot-metal working processes because of pressure and friction. Extruding under these conditions results in tool deterioration and poor dimensional integrity of the products.

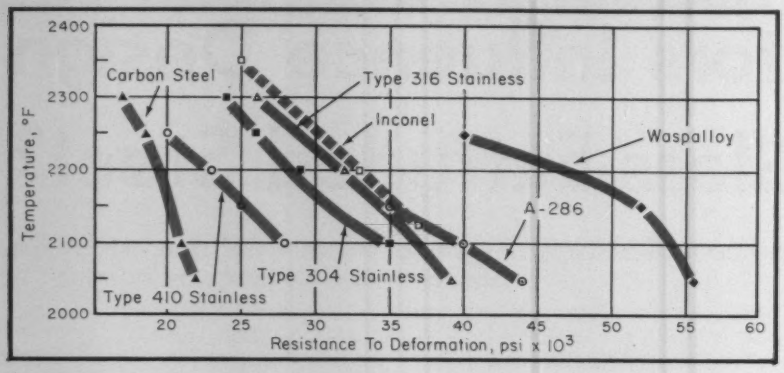
Calls for Lubricant — What's needed is lubrication compatible with the temperature involved. The lubricant must lower friction and insulate. It must also have enough body to absorb the shear stress building up during extrusion, rather than transferring these stresses to the material being extruded.

Glass or glass-like materials meet these criteria. Glass is viscous at

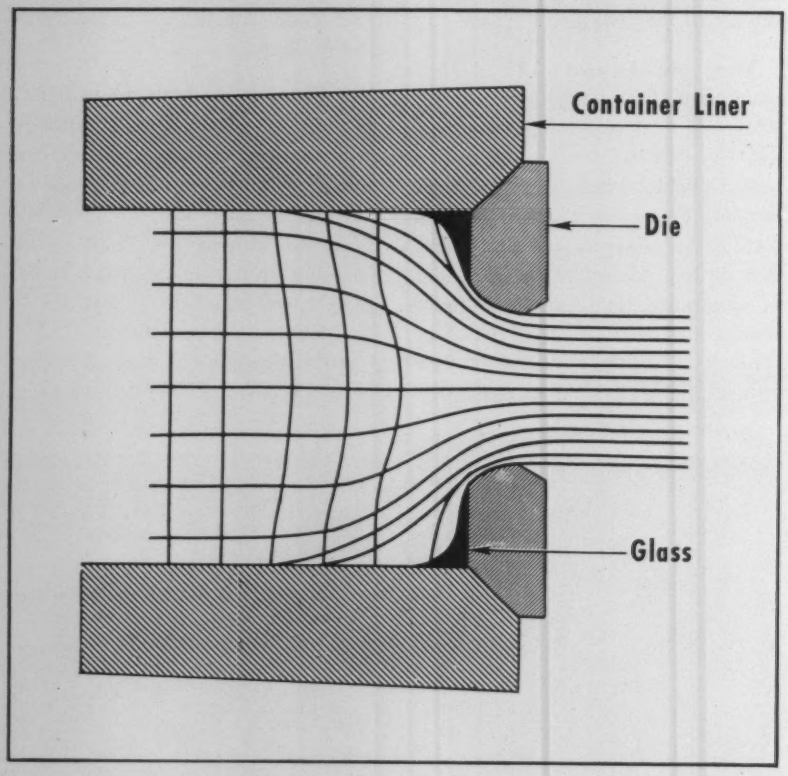


EXTRUDES STEEL: Full advantage should be taken of a press capacity. Allegheny-Ludlum's 1778-ton unit works best with a 5½-in. diam stem.

How Alloys Resist Deformation



Glass Streamlines Steel Flow



operating temperatures. When in contact with a hot billet, it affords a layer of protection that will sustain the pressure applied and flow out gradually and continuously with the product. It also protects tools from overheating.

The glass extrusion process for steel is no longer an infant among other hot working and extrusion processes. Many development programs for improved surface and closer tolerances are going on.

Consider All Factors — Certain aspects of the process and design criteria must be considered before setting up for glass extrusion.

Extruding a billet should be done in as short a time as possible to limit contact time between the hot billet and the tools. That's why steel extrusion presses close as fast as 1200 ipm with no load. When loaded with a billet, exit speeds are 500-700 ipm.

There are other conditions that must be met when extruding steel. Dies must be flat-faced with proper lead-in radii. The container must be heated to 900°-1000°F.

Observe the Limits — There are other criteria to be considered. Take the press, for example. No one press can satisfy all extrusion problems. Each press is designed to work best under one set of conditions.

The extrusion press at Allegheny Ludlum Steel Corp. for example, has a maximum capacity of 1778 tons. Ideally, this tonnage can be delivered to a stem 5½ in. diam with a maximum safe unit pressure of 180,000 psi.

Any reduction in stem diameter would call for a corresponding decrease in tonnage. Why? To keep the unit pressure from going above the safe load. Conversely, when stem diameter is increased to make larger products, unit pressure decreases—and, with it, product versatility.

Does Metal Deform? — Another point to consider is resistance to deformation. With many steels, such as the carbon, low alloy, and Type 40 stainless, this potential bottleneck can usually be overcome. Just raise the extrusion temperature. With these metals, it's the shape of the product and the extrusion ratio that limits the intricacy of produced parts.

Raising the extrusion temperature doesn't always work. The Type 300 stainless are exceptions. And there are certain alloys such as A-286 and AM-355 which should not be extruded above 2200°F for metallurgical reasons.

Depends on Press — How about the cross-section of an extruded part? Determining the maximum cross-section depends upon the container size for a given press, and

available pressures. The minimum extruded cross-section is also a function of the press capacity.

As for minimum thickness, it's generally related to the overall geometry of the cross-section and the flow traits of the metal. Consider these minimum section thicknesses.

For SAE steels, it is 0.120 in.; the Type 403 stainless, it is 0.120 in.; the Type 304 stainless, it is 0.150 in.; for A-286, it is 0.187 in.

Another Difference — Published tolerances for aluminum and brass extrusions reflects another difference between this process and the glass-extrusion process.

Direct contact of the flowing metal with the die, and the long life of the dies used for aluminum permit excellent size control. In the case of steel extrusions, proper allowances must be made for temperature coefficient, glass, straightening, and die wear; these factors affect size control.

In everyday production, these tolerances are easily held for all grades:

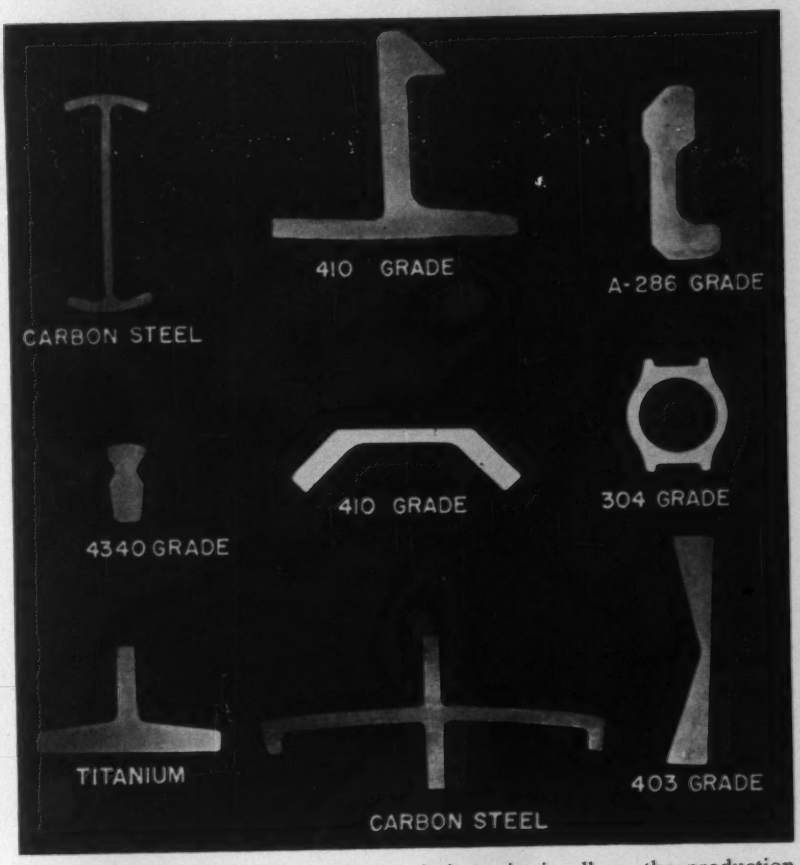
0-1 in. — ±0.015 in.
1-3 in. — ±0.030 in.
3-4 in. — ±0.046 in.
4 in. up — ±0.062 in.

Improve Finishes — Extrusions made by the glass process may not have the dimensional integrity or surface finish of machined parts. However, in many cases, hot extrusion can be supplemented by cold finishing to obtain closer tolerances and better surface finishes.

Steel extrusions are finding their way into many applications where shapes are difficult to roll, or where only small outputs are needed.

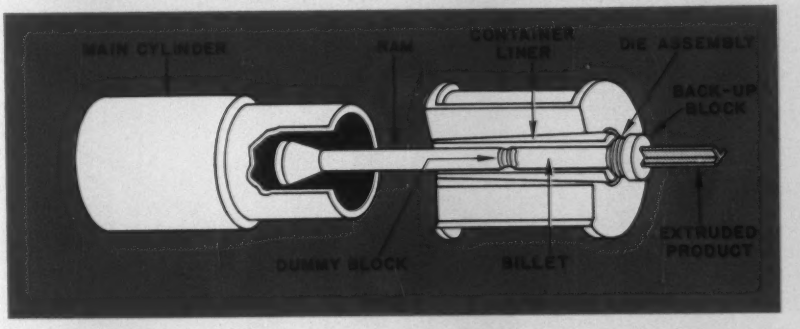
Moreover, the low cost of extrusion dies affords several advantages in satisfying customer needs for anticipated changes in the design of his products from time to time.

Any part that is machined has an economic potential in extrusion. Great weight savings can be realized by designing the extrusion close to the shape of the finished part.



TAKE YOUR PICK: Adherence to design criteria allows the production of a wide variety of steel shapes by the glass-extrusion process.

Note General Press Assembly



SQUEEZES HOT METAL: When ram contacts the hot billet, located in container, pressure develops and causes the billet to flow through die.

Other advantages accrue because operation is completed at one temperature rather than over a range of temperatures. And because of the short working time, grain sizes are thus refined and made uniform.

Reprints of this article are available as long as the supply lasts. Write Reader Service, The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

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Power- and Free-Conveyor Lines Speed Auto-Type Assemblies

Materials handling can mushroom into a major headache, if different assemblies are processed on the same line.

Here's how a company solved its product-mix problems with an overhead-handling system.

■ Early next month, a new final-assembly system will swing into production for Cushman Motors, Lincoln, Neb. The new installation cost more than $250,000; but it's expected to pay for itself in less than three years. This prediction is based on labor savings alone.

The problem which brought about this modernization was that of making labor more productive. After careful study, Cushman's method and time-study department decided the only way to do this was to reduce materials handling.

Up and Over—The problem soon resolved into a comparison of overhead versus floor handling of Cushman units during final assembly. Previously, this work paralleled an automotive-assembly line. Since the old line ran at floor level, assemblers had to be stationed on both sides.

An assembler couldn't cross the line, even though he had time to perform work on both sides. Therefore, the first decision in modernizing the entire line was to get the final-assembly area off the ground.

Another factor in choosing an overhead-handling system was versatility. Small trucks, motor scooters and motorized golf carts are all assembled on the same line. Provisions for repair and unit modifications are also an inherent feature of the new installation.

Small Power Conveyors—Cushman's new installation centers on a power- and free-conveyor system. This system consists of a free overhead track and several separate power conveyors. The overhead track extends from one end of the processing line to the other.

Separate power conveyors are introduced into this overhead track. Individual carriers, for the units being assembled, are alternately pulled along then dropped into free areas.

In the free areas, the units are stockpiled. Sensing devices in these areas control the storage buildup.

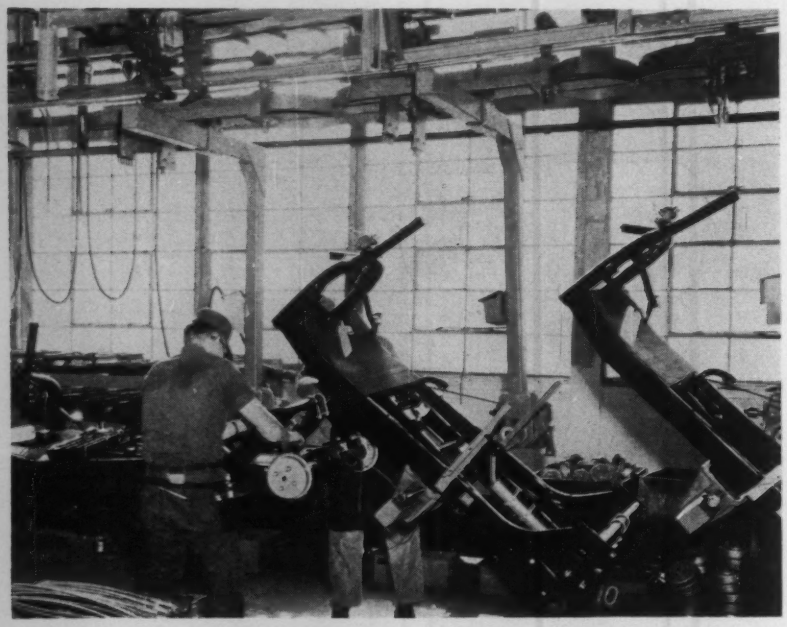
Suspended Carriers—One of the main features of the power- and free-conveyor system is the Cushman-designed carriers. Each carrier can hold a 6000-lb load. However, the heaviest vehicle moving through the line weighs only 1000 lb.

Every carrier is suspended from a load bar by a universal joint. This allows the carriers to hang normally on vertical curves. Also, each carrier isn't concentric about its center. But when loaded, it becomes balanced.

The carriers are easy to load. They firmly clamp the frames of the assembly units by wedge-and-vise action at four points. These clamps hold each unit as it rotates through the assembly stages. An offset bar on each carrier holds the frame in actual balance both fore and aft, and in average balance vertically.

All carriers allow maximum access to all parts of the frame. Thus, they eliminate cross-over problems for assemblers, while placing the frames in the proper working position. Assemblies are power rotated into any desired position.

Smooth Flow—After the frames are loaded onto the power- and free-conveyor, the carrier system is released into a rotating-storage area.



THREE-WHEEL LINE: Assembler tilts a three-wheel-vehicle frame as it leaves the first working station on one of the style-assembly lines.

Prior to release, the entry switch is fed a set of signals. These signals pinpoint two alternate daily schedules according to the unit's style (whether it's a two- or three-wheel vehicle) and to match a fixed model designation.

Alternate scheduling is important. It allows all units for the first day's schedule to be built before the next day's schedule is released. As a result, each work run is completed individually, even if both schedules are stored in an overlapping manner.

Upon release from the loading point, a carrier, with its frame, automatically moves into the rotating-storage line. It progresses in random order to the line's ceiling-level section.

By the Numbers—Later all units enter a lower-level section. Entry hinges on model numbers and the desired production schedule. The storage line holds 75 units. All units rotate through this closed-conveyor circuit, until they're automatically called out for production.

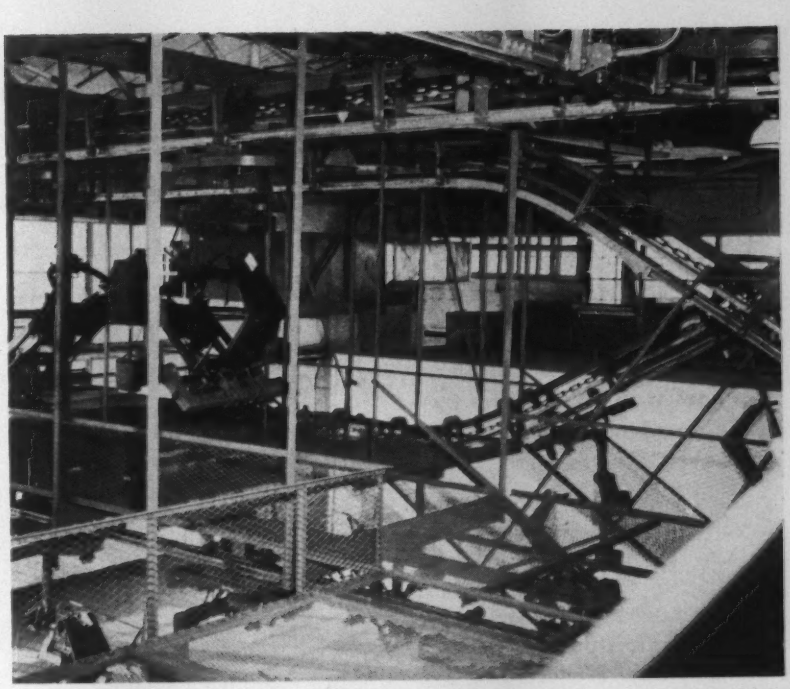
At any time while a carrier is in storage, its schedule can be altered. This allows quick changeovers to replace bad production units.

There are holding stations for two assembly lines at the unloading end of the storage line. One of these stations stocks two-wheel units: Its mate holds three-wheel frames.

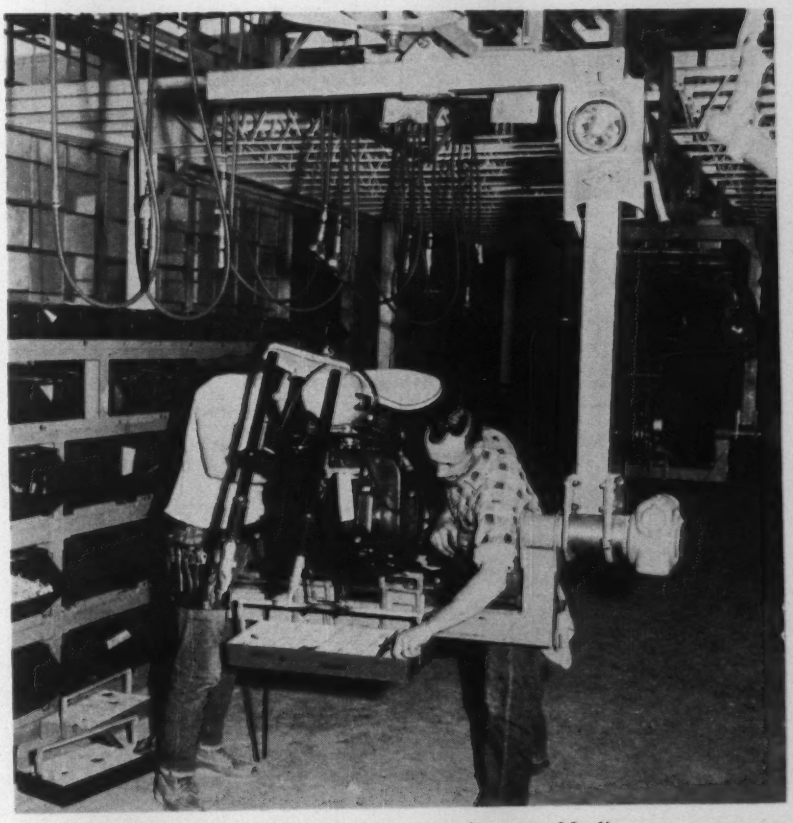
By holding the units in bank storage, both stations reduce the time needed to transfer frames from storage to the assembly lines. These unloading stations automatically choose the carriers. They match each carrier to either the production schedule or the unit style.

At the end of each assembly line, there's an inspection point. Prior to entering this check-out area, one signal setting for each carrier is cleared. If the assembly passes inspection, no signal is set. This lets the carrier pass into the shipping area.

When an assembly doesn't pass inspection, the signal pin is reset. This causes the unit to enter one of the conveyor-fed repair lines.



CEILING-LEVEL STORAGE: After receiving coded instructions, vehicle frames automatically move to the rotating-storage line's upper level.



READY FOR ASSEMBLY: Carriers enter the assembly lines at a common point. Each assembly station is arranged to handle a specific model.

New Corrosion-Testing Service Solves Pipe-Valve Problems

Alloy choice plays a vital role in valve and fitting life.

Actual performance in corrosive lines very often differs from the data obtained in handbooks and laboratory tests.

■ Valve and fitting failures, caused by accelerated or extensive corrosion, are often mistakenly blamed on design or other mechanical factors. To correct this costly fallacy, the Alloy Steel Products Co., Linden, N. J., offers a new corrosion-testing service.

Normally, it's the job of a chemical or corrosion engineer to choose the alloy when buying valves and related equipment. Often this equipment must withstand severe corrosion. When this is true, the new field-testing service provides valuable aid in selecting the proper alloy.

Actual Performance -- Approximate data, gathered from old lab tests or from standard handbooks, often proves meaningless when it's compared to full-scale operating conditions. Thus, the new testing service fills an important gap by gathering data at actual valve sites.

Aloyco uses a special test rod which is mounted inside the desired processing line. Samples of many different alloys are attached to the rod. This allows each sample's relative resistance to be checked against actual operating conditions.

The rod produces only a minor pressure drop. Therefore, it can be tolerated in almost any operating line.

Under the direction of Aloyco's field engineers, these test rods are installed and exposed to the corrosive solution for at least 60 days. Longer exposures are used when feasible.

Monitor Corrosive Flow—When the test period is over, the rod assembly is removed and shipped to the Linden laboratories. Complete evaluation involves a critical visual inspection. Physical patterns of the corrosive products yield data on the type of fluid flow as well as the type and degree of corrosion.

Next, all corrosive products are carefully removed from each sample. Then the samples are weighed to check the change in weight as a result of corrosion. These figures are computed to obtain corrosion rates in inches per year.

Unusual or unexpected corrosive effects on samples undergo additional investigation. Follow-up checks include microstructural examinations and chemical analysis.

Theoretically, test rods carrying samples of almost every alloy could be tested. However, this might create long delays and it would prove much too costly. By using detailed reports of process conditions, the number of alloys to be tested is narrowed down to about six or seven.

Unexpected Results—Results of the field tests are often surprising. Very often these results amaze Aloyco engineers as well as the customer's plant men.

Consider the situation that cropped up in a light-oil-treatment section of a byproduct-coke installation, built by the Koppers Co. In this unit, hydrocarbon oils, produced at the plant, are treated with concentrated sulphuric acid. Then the mixture is diluted with water.

Eight double-disk gate valves handle the tank's discharge. Based on the reported acid concentration in the discharge line, about 40 pct, the field engineers recommended Aloyco 20 as the valve material.

This valve material is a cast-

How Alloys Resist Exposure

Specimen Code*	Alloy	Penetration, in. per year	Remarks
A-1	Stainless, type 304	0.0051	Moderate to heavy etch. No local attack.
A-2	Stainless, type 316	0.0000	Light tarnish. No other evidence of attack.
A-3	Aloyco 20	0.0000	Same as A-2.
A-4	Aloyco 25-12S	0.0023	Light to moderate etch. No local attack.
B-1	Stainless, type 304	0.0000	Bright and clean. No evidence of attack.
B-2	Stainless, type 316	0.0000	Same as B-1.
B-3	Aloyco 20	0.0000	Same as B-1.
B-4	Aloyco 25-12S	0.0000	Same as B-1.

* Samples A-1 to A-4 in contact with line. Samples B-1 to B-4 insulated from line.

stainless alloy. It consists of about 20 pct Cr, 30 pct Ni, 3.5 pct Cu and 2.5 pct Mo. Maximum carbon is 0.07 pct.

Bad Guess—When the plant began actual operation, it was found that the corrosion was much worse than expected. Along with the sulphuric acid there were other organic-reaction products such as sulphonic acid. This boosted operating heats to 135°F. At this point, Aloyco's field engineers suggested that a test rod be inserted in the line.

After checking the results of the test-rod exposure program, the field engineers recommended that valves of Aloyco N3 (Hastelloy C) be used in the line. This was done. As a result, these valves are still in use after three years of trouble-free service.

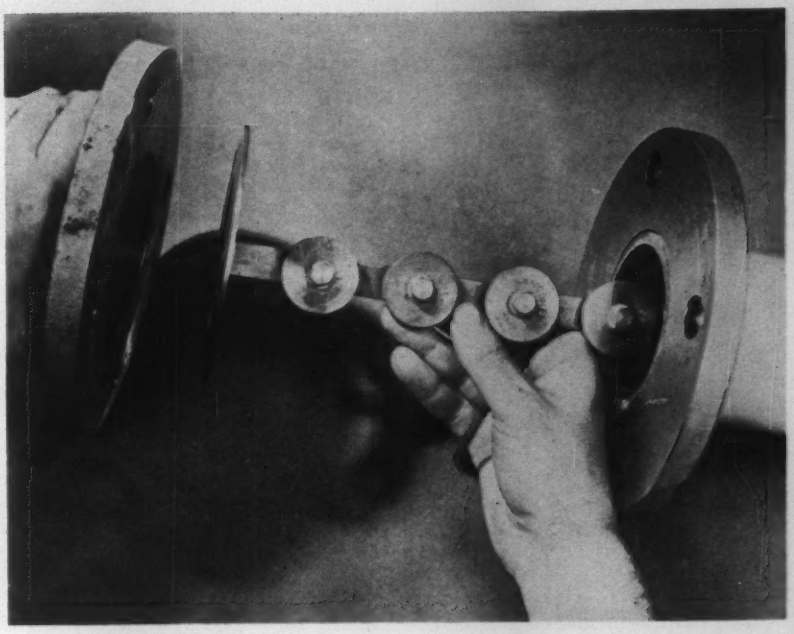
Another problem centered on pipe-line corrosion in an ammonium-nitrate plant. Type 304 valves in the loading and circulating lines of the ammoniator were corroded quite a bit after handling nitrogen solutions of varying compositions. Temperatures within this ammoniator line vary from 80°-120°F. After two years of operation, serious corrosive effects were observed.

Dual-Purpose Tests — Feeling that a question of alloy selection was paramount, field engineers inserted two test rods in the line.

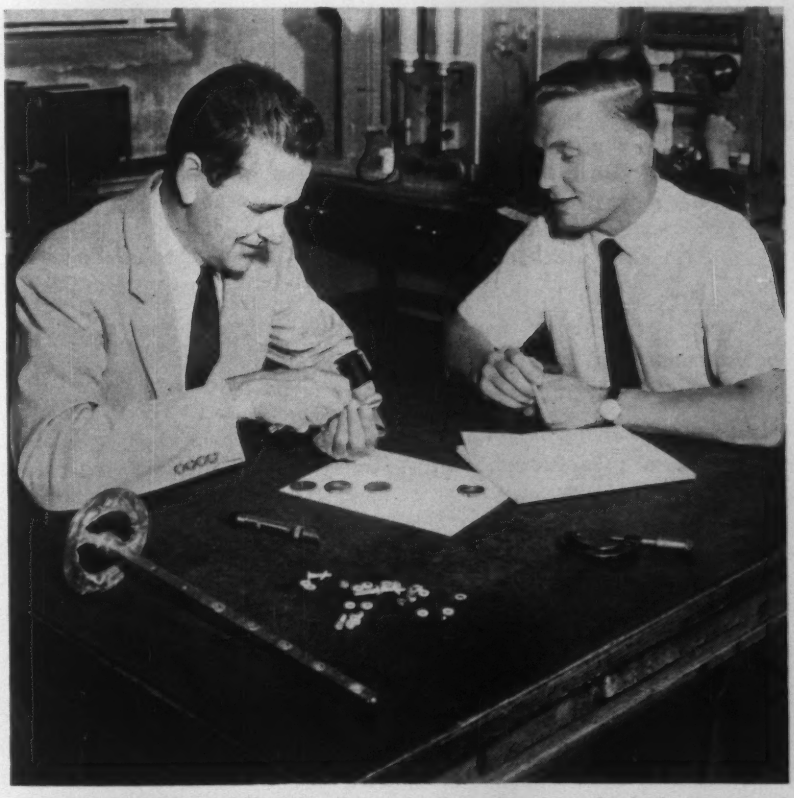
On one test rod, all samples were insulated from the pipe line by means of Teflon washers and sleeves. On the second rod, all samples were in contact with the line.

After 720 hours of exposure, the rods were removed and sent to the laboratories. Results of these tests appear in table form. You will note that there's no evidence of corrosive attack with the insulated samples.

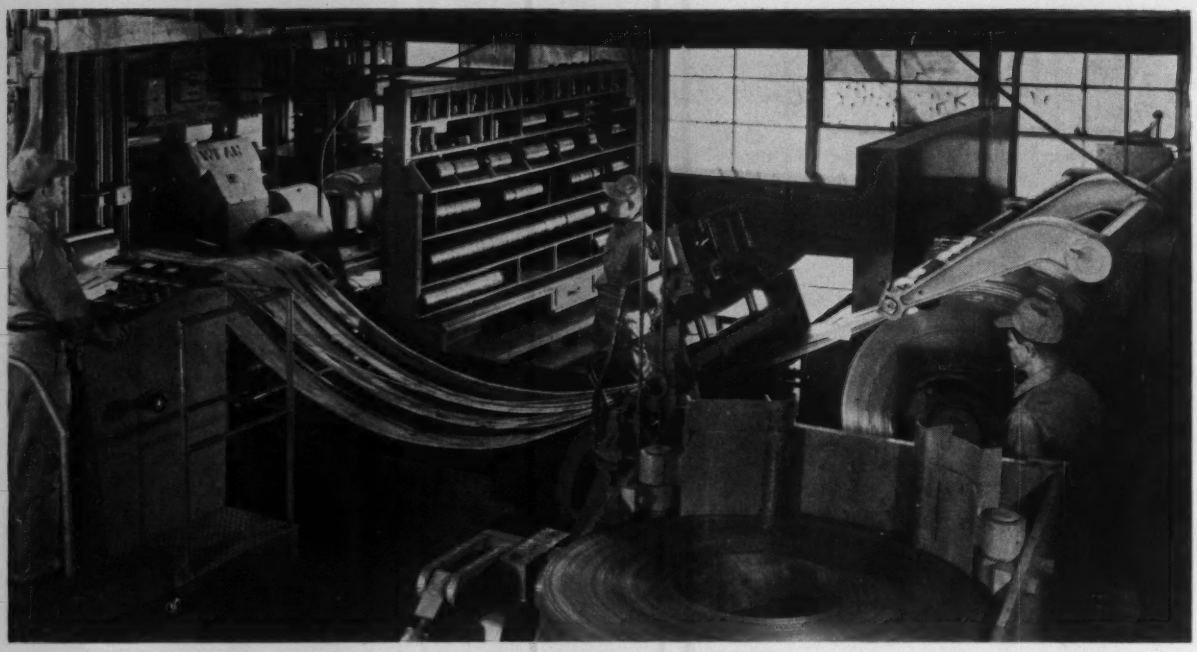
This test proved that the main cause of corrosion in the line was electrolytic. In this corrosive environment, type 316 stainless and Aloyco 20 aren't affected. As a result, the valves now serving in the line are type 316 stainless steel.



TEST-ROD ASSEMBLY: After alloy samples are fastened to the special test rod, the assembly is inserted inside the corrosive line. The flange on the test rod fits between the processing line's pipe flanges.



CHECK FLUID FLOW: Visual examination pinpoints physical patterns of the corrosive products. This yields data on the type of fluid flow as well as the type and degree of corrosion within the processing line.



SLITTING TECHNIQUES: Precise slitting equipment allows the company to slit materials to close tolerances.

What Quality Control Can Do To Further Productivity

By **J. E. Longenecker**—Chief Mechanical Engineer, Magnetic Metals Co., Camden, N. J.

A good program of quality control can keep rejects low, yet turn out a sound product.

Look at this blueprint of success from a manufacturer of critical core laminations.

■ It's a boon to any company to be able to control each step of production from original design to the finished product. A builder of magnetic core laminations follows such a procedure. By constantly refining its techniques, this company is now turning out over 100 million pieces per month, with a rejection rate of less than 0.5 pct.

At Magnetic Metals Co., Camden, N. J., every incoming order, complete with part print specification, is checked against the final needs of the finished product. This means that the toolroom doesn't even see the drawings until both assembly and component sections have been checked and double checked.

Are the dimensions accurate? Are they practical? By answering these questions in advance, shop errors caused by on-the-spot calculations are eliminated.

Source of Supply—Since the Camden manufacturer is an independent producer, it can purchase tool steel, castings, carbide segments and other die materials from a wide range of suppliers. There's no reason to depend upon one source for these materials. The same thing is true with the purchase of raw materials for stamping of laminations.

On incoming silicon steels, a mechanical test is performed to check thickness, coil set and finish. Nickel-alloy steels receive an even more thorough check because of their greater value. The latter alloy is also tested for electrical properties by a special test stamping. It's then given a standard anneal, and finally graded.

This grading system insures a wider choice of nickel-alloy steels. Most of these steels are sold on a permeability basis. Since the range of permeability is wide, it's vital to have a broad selection.

Precision Slitting — Magnetic Metals has installed two slitters in its plant; one is for heavy and the other for light work. We can slit and handle alloys as thin as 0.0005 in.

The large slitter can handle coils up to 36 in. wide and as heavy as 15,000 lb. As a result, we can keep inventories low by buying wide coils. The company also takes pains to slit materials to much closer tolerances than you get from outside sources. Where mill tolerances usually start at ±0.008 in., Magnetic Metals maintains ±0.003 in.

Closer control on the width tolerance means that the stock guides on the dies can be held closer, thereby insuring more accurate stampings. This control pays off on scrapless E and I laminations where the width of the S shape is the same as that of the slit material.

Camber Control—The fine degree of control on slitting work can also apply to the control of camber in raw materials. Mill tolerance on camber is ⅛ in. in 8 ft, while Magnetic Metals' limits are 1/64 in., and even closer, in 8 ft.

Such emphasis on camber comes in handy on large dies for rotor and stator laminations. Some of these dies are up to 60 in. long. Therefore, strip with excessive camber could mean the difference between economical runs and complete failure.

Tool Design — The company steps up the quality of the die through custom-made precision die sets, pins and bushings. Engineers have found that commercial die sets aren't good enough for the precise, long runs required. As such, die sets are designed and built from Meehanite or steel blocks. They are machined, ground and scraped to size for parallelism and finish.

Spring-guided strippers are used most of the time. These strippers cost more than the fixed channel types, but they effect longer, trouble-free runs and better stamped blanks. Why is this so? The raw material, you see, is held absolutely flat during punching.

Where they are needed, we also use massive bolster plates to support the die over the press bed opening. This added support keeps the die set from deflecting. During a run, it prevents distortion, breakage, or excessive scoring and wear of the cutting edges.

All Along the Way—Tools are inspected in each step of manufacture. The first major check comes just after heat treating but before final grinding. After grinding is completed, all dimensions are checked out 100 pct to tolerances of ±0.0001 in. or closer.

This approach kills two birds with one stone. For one, the work of the grinding personnel is checked. Also, it insures that when the parts are assembled, all dimensions and specifications called for in the drawings are rigidly maintained.

After each section is checked and assembled, final inspection is made on the entire assembly to make certain that proper alignment exists between punch and die.

Nothing Overlooked — Still another inspection step concerns the stampings at the press during a run. First piece inspection is required of the part on every new setup. After this thorough check, the press is inspected at intervals of 15 minutes or less in the course of each production run.

During press inspection, laminations are checked for thickness variation, burrs and other deviations from standard. Following annealing, parts are again checked mechanically and electrically to make sure they are on the beam.

The records plotted of all inspection steps go into a file. Very often, they are retrieved later on and are used as a guide when the repeat orders come into the house.

To sum up, this quality control program gives us dies with an efficient operating capacity of over 100 million strokes per die life.

SYSTEMATIC GRADING: Lamination shapes are graded according to their electrical traits.

STUDY EVERY ORDER: Requirements of the end product are met by checking customer orders.

Machine Solders Automatically

Speeds Joining Cycle of Vacuum Actuator Assemblies

Soldering can be economical if it's combined with automation.

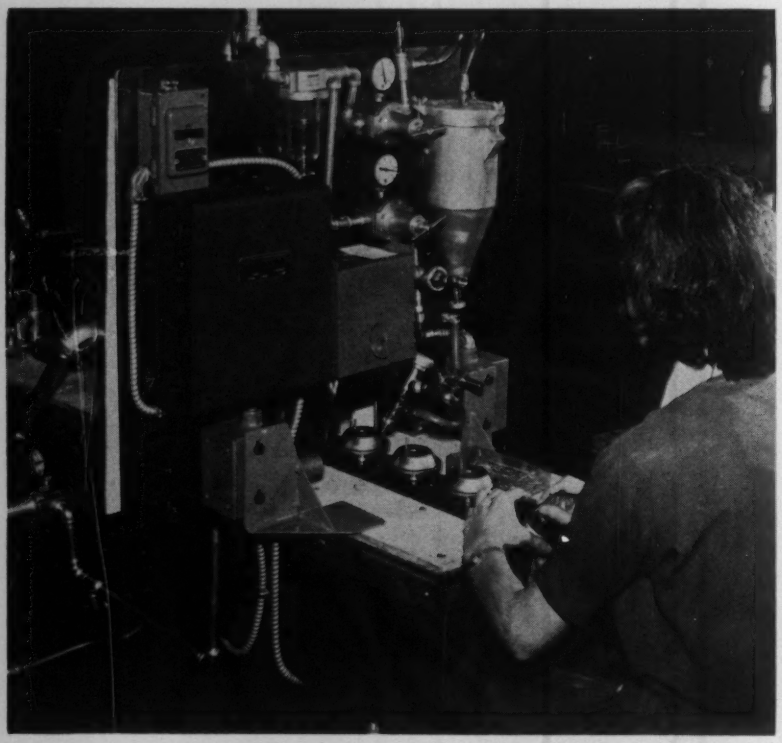
All the operator does is place the parts on the line. The rest is automatic.

■ Inexpensive machinery and simple tooling are combining to bring automation into the field of soldering. Here's a case where one company spent a modest sum to increase soldering speeds by 25 pct. The new automated setup replaces a manual system. Production is now very simple; it's no longer complex.

At Howell Industries, Howell, Mich., flux, solder alloy, cleaning agents and binders are all homogeneously blended into one stable paste form. Formerly, each one of these ingredients had to be applied separately. The new soldering line has been put to work on the company's vacuum actuator assemblies.

The assembly consists of a brass tube soldered into a terne-plated steel cup. The cup becomes the outside shell of the vacuum actuator used in automatic controls of heater and defroster devices. They are made for Chrysler Corp., Detroit.

Four-Station Line—The soldering machine is made by Fusion Engineering, Cleveland. It includes an in-line constant speed conveyor with four fixed stations through which the parts pass. Solder paste is applied in the first station. In the second one, heat is applied. The last two stations cool the parts and unload them.



PASTE SOLDER: An automatic dispenser deposits the exact amount of paste solder onto the parts as they pass through the first station.

One operator is needed on the soldering line. (The old system required eight workers.) The operator first places the cup on a special ceramic fixture. The brass tube is then placed inside the cup. From there on, it's all up to automation.

Electronic Sight—An electric eye spots the parts as they travel through a beam of light. At this point in the cycle, the eye actuates the dispenser of paste solder automatically. In turn, the exact amount of paste solder is deposited at the base of the brass tube.

In the next sequence, parts pass between two banks of flame. The heat from the burners pulls the paste solder around the pin. End result is a vacuum-tight hermetically-sealed joint. At the same time, the brass tube gets a secondary annealing.

Forced Cooling—Part quenching follows. Soldered parts pass underneath two copper tubes. Small holes have been drilled in the bottoms of both tubes. Water then drops from the tubes onto the cups, thereby performing the quench.

After the quenching stations, the parts are then dropped off onto a chute which feeds them onto a conveyor to the next operation.

Cost Report — According to Howell Industries, the new setup has reduced total labor costs by $1000 per month. The company also maintains that it recovered the cost of the machine in about 2½ months. Unit cost of paste solder is the same as preformed rings.

This soldering setup is based on three ingredients. First, you have the paste solder. Then you have the automatic dispensing equipment. Both items are Fusion Engineering products. The third item is a conventional system for automatic heating.

NEW . . . LODGE & SHIPLEY 2516 • 2516-21

SUPERTURN

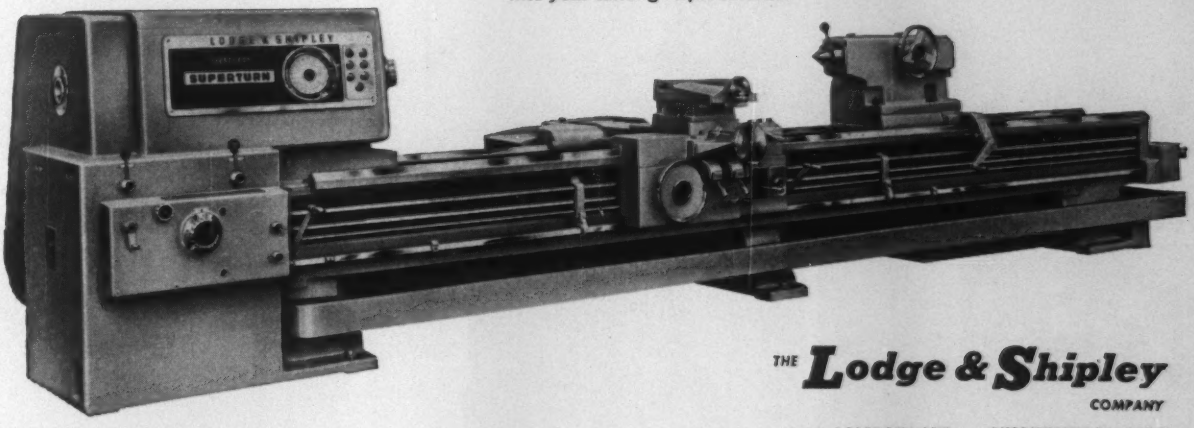
BIG JOB

LATHE WITH HORSEPOWER TO SPARE!

FULL 60 HORSEPOWER . . . 32 SPEEDS, POWERSHIFT "PRESELECTOR" . . . SWINGS 28" OVER BED

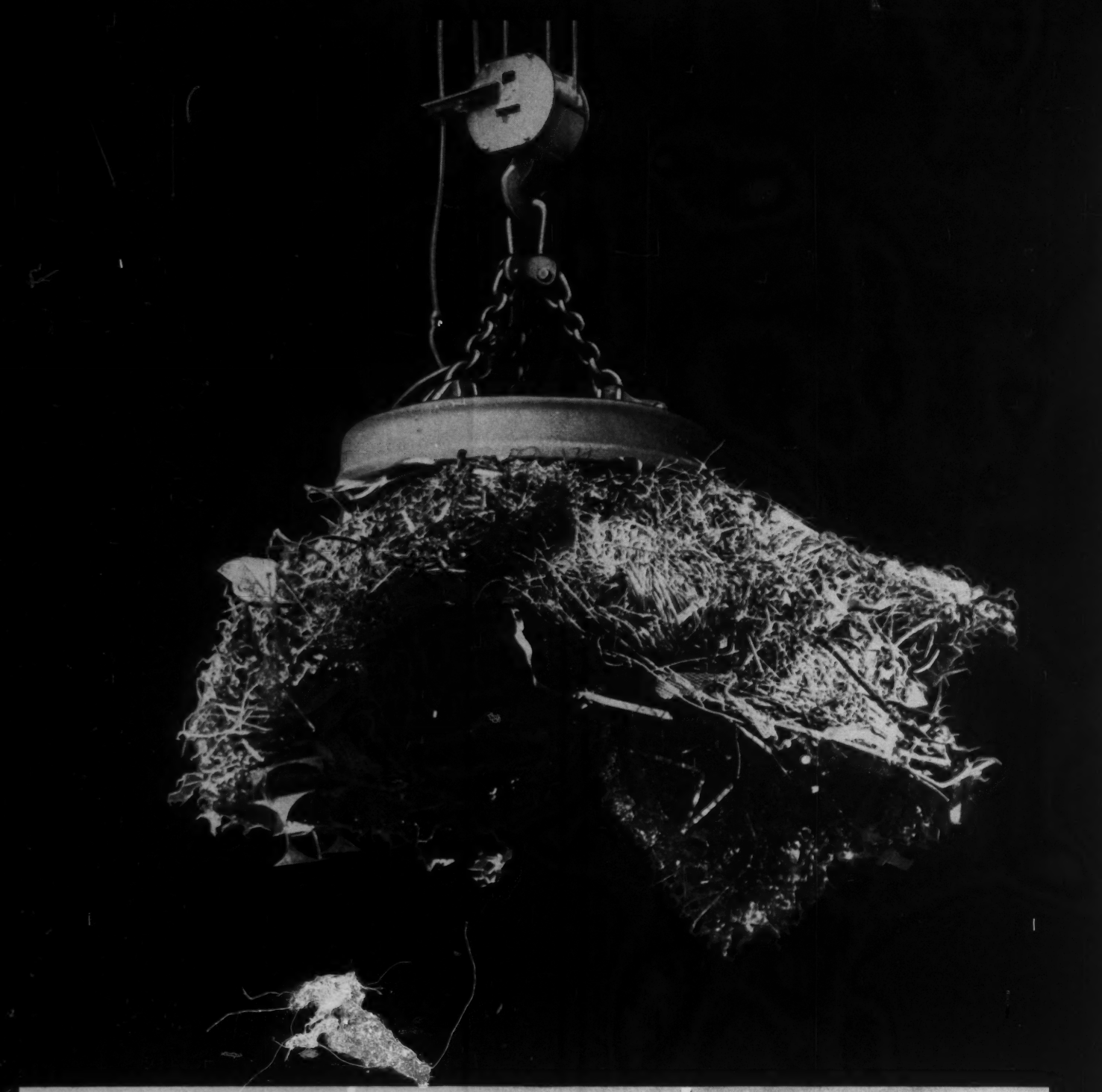
If you're looking for "big job" turning ability . . . capacity to turn a 16" diameter shaft, for example . . . with super accuracy, speed and convenience . . . this is it! Important too, is the fact that the SUPERTURN Lathe is designed for present and future turning techniques . . . ideal for ceramic tooling, for ever-increasing cut and horsepower requirements!

A full listing of SUPERTURN features and advantages is impossible in this limited space. The SUPERTURN is big, rugged, yet . . . with the Powershift Preselect Headstock and 4-Way Power Rapid Traverse . . . amazingly fast and easy to operate. Lodge & Shipley confidently invites comparison with any other 2516 lathe. May we give you details on how the SUPERTURN fits into your turning requirements?

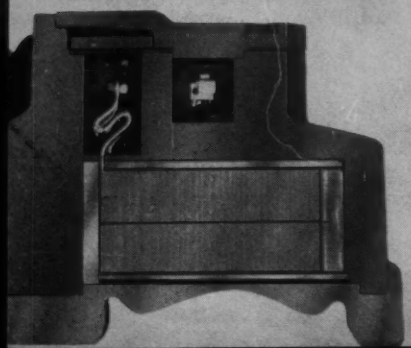


THE Lodge & Shipley COMPANY

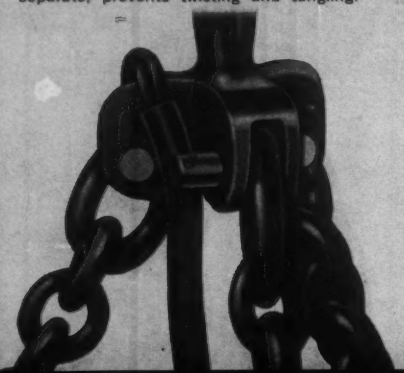
3073 COLERAIN AVE. CINCINNATI 25, OHIO



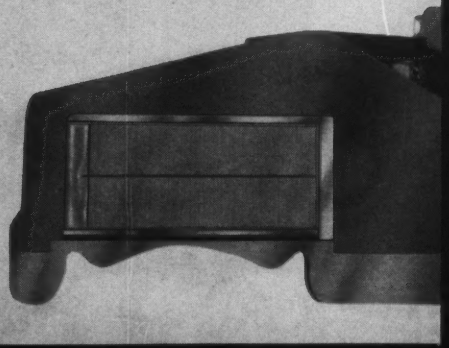
Two-compartment terminal box with lip on cover fitting into recess which relieves strain on hold-down bolts due to side blows.



3-point yoke design of cast steel keeps chains separate, prevents twisting and tangling.



Aluminum strapping on coils and special epoxy fill keep Cutler-Hammer lifting magnets operating cooler, longer.



Now! Lift all day long at high capacity with new Cutler-Hammer aluminum wound magnets

Lightweight aluminum strap coil keeps magnet cooler . . . adds to magnet life

Meet the magnets that never get tired, even on a sweltering summer day, the new Cutler-Hammer aluminum-wound lifting magnets.

With anodized aluminum strapping which eliminates insulation formerly required and a special epoxy fill designed to conduct off heat, the new Cutler-Hammer magnets operate cooler, give you more lifting capacity and last longer than copper-wound magnets.

Unlike the so-called "lightweight" magnets, there is no sacrifice in lifting capacity that results from fewer ampere turns to keep weight down. Completely watertight, these rugged magnets can safely be used for underwater service if given proper care and maintenance.

You can get the new Cutler-Hammer lifting magnets in four sizes: 39″, 45″, 55″ and 65″. Most sizes are available bolted or welded. Send for Pub. LO-108-Y-246.

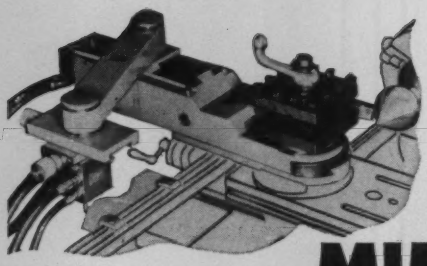
What's new at Cutler-Hammer?

New, better products, new plants, new engineering, new services are just part of the story at Cutler-Hammer. We're geared up to meet the tremendous demands of the next few years. We're ready to give you practical assistance in your growth plans for the future. Contact the nearest Cutler-Hammer sales office or your Cutler-Hammer distributor to see how.

WHAT'S NEW? ASK...

CUTLER-HAMMER

Cutler-Hammer Inc., Milwaukee, Wisconsin • Division: Airborne Instruments Laboratory • Subsidiary: Cutler-Hammer International, C. A. • Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.

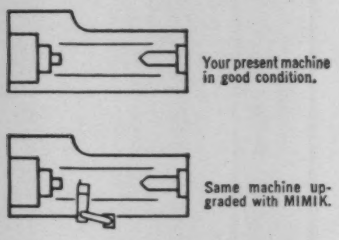


Consider:
THE SIMPLE ECONOMICS OF the MIMIK® METHOD

Improved production facilities cost money. The big questions are where? when? and how much? See how the Mimik Hydraulic Tracer provides the degree of flexibility, low capital and operating costs and high precision quality control needed to keep ahead in machining work today.

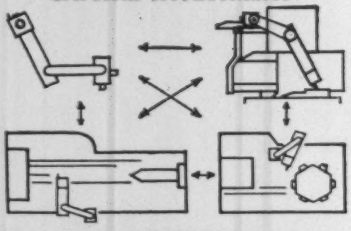
Basic Economics of **MIMIK TRACERS**

1 LOWER CAPITAL COSTS



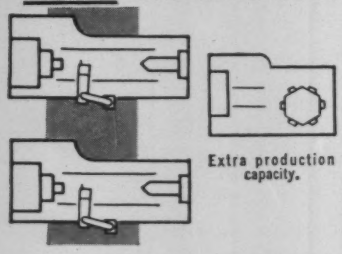
Maximum output with minimum outlay is obtained by the MIMIK METHOD.

2 STILL LOWER CAPITAL INVESTMENT



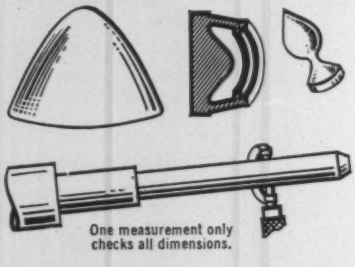
One versatile MIMIK Tracer can serve three machines of same general size because the MIMIK is completely interchangeable within minutes.

3 MORE PRODUCTION REDUCED OPERATING COSTS



Two machines equipped with MIMIK Tracers will free your third machine for bonus production.

4 GREATER RANGE OF WORK



No limitation to work-piece contour or size with MIMIK. Strict accuracy of MIMIK action ensures constant repetition.

Modernize with the MIMIK METHOD. A thorough study of your machinery requirements by Mimik-trained specialists will show how the truly interchangeable MIMIK Tracer can create the flexibility that today's production schedules need.

Ask our Mimik-man to discuss the MIMIK METHOD with your production team. He has a wealth of experience and information at his finger tips.

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WEST COAST: Allied Pacific Manufacturing Co., Compton, Cal.
CANADA: Retor Developments Ltd., Galt, Ontario

Mimik-men are everywhere

PATENT REVIEW

New Patents In Metalworking

No Temperature Rise

Temperature measuring system, M. O. Holowaty and L. M. Bernick (assigned to Inland Steel Co., Chicago), Oct. 25, 1960. Apparatus and method senses and prevents temperature gradients along the longitudinal axis of a milling roll. No. 2,957,349.

Steel for the Army

Low-alloy, high-tensile-strength, high impact strength steel, C. M. Carman and D. F. Armiento (assigned to U. S. Sec. of the Army), Nov. 8, 1960. An ordnance type steel comprises 0.3-0.35 pct C, 0.75-1 pct Mn, 0.7-0.9 pct Cr, 1.5-2 pct Ni, 0.4-0.6 pct Mo, 1.25-1.75 pct Si, 0.08-0.15 pct V, and the balance essentially all Fe. No. 2,959,506.

Increases Temperature

Open-hearth furnace regenerator, R. P. Heuer (assigned to General Refractories Co., a corp. of Pa.), Nov. 8, 1960. Heat recovery system, for an open-hearth steel melting furnace, increases the furnace operating temperature economically. No. 2,959,406.

Steel for Forgings

Production of large masses of steel suitable for the production of forgings, and apparatus therefor, A. O. Schaefer, Nov. 8, 1960. Process for manufacturing large masses of steel or other metal having a high degree of homogeneity. The metal piece is cast in increments at optimum temperatures. No. 2,958,913.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Air Grinders

Technical details on a complete line of air grinders are given in an illustrated folder. A description of the safety valves on the 6- and 8-in. grinders also is supplied. (Thor Power Tool Co.)

For more data circle No. 1 on postcard

Polyethylene Tanks

Comprehensive, a two-page data sheet contains detailed information on a line of standard size, polyethylene tanks. The tanks are made of high-density polyethylene with heavywall construction. (American Agile Corp.)

For more data circle No. 2 on postcard

Vacuum Furnaces

Vacuum-type furnaces are illustrated and described in an eight-page bulletin. Pictures and drawings show various furnaces. (Lindberg Engineering Co.)

For more data circle No. 3 on postcard

Sheet Steel Storage

An interesting study describes the handling and storage of steel sheets. Photographs show "before" and "after" scenes of the storage system operation. (The Raymond Corp.)

For more data circle No. 4 on postcard

Delaware River Port

Colorful and highly illustrated, a 72-page booklet concerns itself with the Delaware River Port. It contains current information on the facilities and service of the ports of Philadelphia, Chester, Marcus Hook, and other port cities on the Delaware River. Also included is general information on the administration of the Delaware River Port Authority. (Delaware River Port Authority)

For more data circle No. 5 on postcard

Centerless Grinder

Described and illustrated in a six-page bulletin is a centerless grinder. The machine produces workpieces to close tolerances. (Landis Tool Co.)

For more data circle No. 6 on postcard

"C" Clamps

Air-operated "C" clamps are described in a four-page illustrated bulletin. The bulletin supplies specifications, outstanding features, optional features, ordering data and dimensions. (Airmatic Valve, Inc.)

For more data circle No. 7 on postcard

Abrasive Cut-Off Wheel

Regular, resinoid bonded abrasive cut-off wheels are reported in a catalog bulletin. Information is presented about production cutting use; also, general tool-room and machine-shop use. (Simonds Abrasive Co.)

For more data circle No. 8 on postcard

Compressor Systems

High-pressure, packaged compressor systems are presented in a short bulletin. The systems are for military, commercial, laboratory and pilot plant use. Its features are described and illustrated. (Clark Bros. Co.)

For more data circle No. 9 on postcard

Blanking Process

A six-page illustrated catalog describes a smooth-edge, blanking process. This process produces precision stamped low carbon steel, aluminum, brass and copper blanks. It does this with smooth, straight edges, in a single operation from coil or strip stock. The catalog describes and illustrates the special

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FREE LITERATURE

120-strokes per minute hydraulic press used to produce these parts in conjunction with smooth-edge blanking dies. (Hydro-Cam Engineering Co.)

For more data circle No. 10 on postcard

Controlled Volume

On controlled volume pumps, a 32-page bulletin features a selection data guide, material selection charts and capacity-pressure selection tables. (Milton Roy Co.)

For more data circle No. 11 on postcard

Rotary Feeder

For delivering and controlling the feed rate of dry, pulverized and granular materials, a rotary feeder is described in a bulletin. The two-page illustrated publication includes a photograph and dimensioned drawings and specifications for all sizes of the feeder. (Fuller Co.)

For more data circle No. 12 on postcard

Face Protection

Fifty-seven eye and face protection products and accessories are featured in a 16-page catalog. The illustrated catalog gives information on lenses, replacement parts, goggle cases and the like. (Sellstrom Mfg. Co.)

For more data circle No. 13 on postcard

Temperature Controls

Differential, expansion-type temperature controls are shown in a short catalog. Included is a general description of their operation. In addition, a picture and brief specifications of each model are also given. Both electric and pneumatic instruments are covered. (Burling Instrument Co.)

For more data circle No. 14 on postcard

Steel Die Sets

Literature on die sets gives illustrations, sizes and other technical data on various sizes of the sets. The four-page brochure includes a price list with quantity discounts. (Wheatley Economy Die Sets, Inc.)

For more data circle No. 15 on postcard

Modern Warehousing

Facilities, policies, operating practices and services of the company are described in a 28-page, two-color brochure. The literature describes the inner workings of the warehouse. It shows its unusual inventory control system and methods for rapid handling. Slitting, shearing and sawing facilities are also given. (T. E. Conklin Brass & Copper Co., Inc.)

For more data circle No. 16 on postcard

High-Sensitivity Switch

In detail, a two-page data sheet covers a highly-sensitive, subminiature switch. The switch is for use where close control sensitivity or response is necessary. Data sheet includes mounting dimensions, operating characteristics, electrical rating and instrumentation fields. (Micro Switch)

For more data circle No. 17 on postcard

Pipe Thawing

Data on the fast, safe thawing of frozen water pipes, by low-voltage electricity, are contained in a bulletin. Some of the subjects covered are: electric method, types of equipment, instruction for successful thawing and safety suggestions. (Hobart Bros. Co.)

For more data circle No. 18 on postcard

Decorative Finishes

The subject of a bulletin is custom strip coating of aluminum and steel. The bulletin describes this process for applying decorative and protective finishes to metals. It is shown step by step. (Zegers, Inc.)

For more data circle No. 19 on postcard

Floor Trucks

Industrial, institutional and commercial floor trucks are presented in a 16-page catalog. The catalog contains illustrations, descriptions and specifications on the manufacturer's more popular truck models. (Hamilton Castor & Mfg. Co.)

For more data circle No. 20 on postcard

Fluidized Bed

A four-page bulletin describes fluidized bed heat treating equipment. The publication goes on to explain how process works to permit up to 85 pct reduction in heating time; intermediate quenching rates and good temperature uniformity throughout the work load. (General Electric Co.)

For more data circle No. 21 on postcard

Multiple-Wheel Grinder

Multiple-wheel precision grinders, 10- and 14-in. type, are illustrated and described in a 16-page catalog. (Landis Tool Co.)

For more data circle No. 22 on postcard

STEELMAKING AT JESSOP

175,000 pounds x 150 mph = shock treatment

The powerful jet engines whine in reduced-throttle restraint as the big, sleek aircraft maneuvers gracefully in its approach pattern.

In the cockpit, the crew goes through a check list. At one point the wheels are lowered and three green lights appear, indicating the gear is in position.

Then, a moment later, the pilot eases the 175,000 pound aircraft traveling 150 miles per hour onto the concrete—safely, surely, with confidence.

Probably, the steel in the landing gear was forged by Steel Improvement & Forge Company of Cleveland. For those components that bear the brunt of the impact, Steel Improvement purchases a Macro-Clean alloy made exclusively by Jessop at its Green River plant.

Only Jessop has it, this tough, sound-centered Macro-Clean alloy that takes in stride the transverse shock imposed on aircraft landing gear.

And the excellent physical properties inherent in Macro-Clean alloys make them ideally suited for numerous other applications too—crankshafts, gears of all kinds, pellet mills, driveshafts, large bearings and oil field goods for example.

Call any of Jessop's 23 sales offices in North America for Macro-Clean aircraft and forging quality alloys and a full range of specialty steels.

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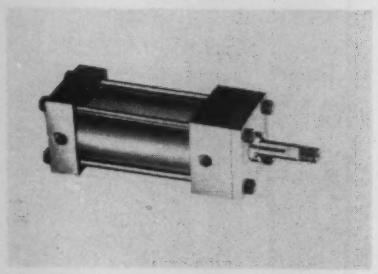
JESSOP

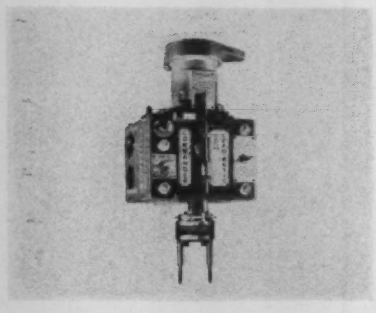
New Materials and Components



Cylinder Features Nylon Piston Bearing

For 250 psi air, an interchangeable cylinder also gives up to 2500-psi oil service. The cylinder offers increased cycle life, higher efficiency and reduced maintenance. Features include: case-hardened piston rods, chrome-plated barrels and piloted, quick-change rod packing cartridges. Nylon piston bearings alleviate scoring and lengthen barrel wall life. Self-adjusting block-vee rod packings compensate for wear with negligible breakout friction. Cylinder sizes are 1½-6 in. (Alkon Products Corp.)

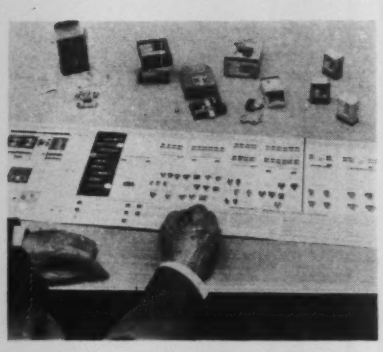
For more data circle No. 25 on postcard, p. 73



Drill Head Drills and Taps Close Centers

An adjustable, two-spindle drill head has a capacity of ⅛ in. in steel. It does close center multiple drilling and tapping work. It mounts on any drill press or drill unit to drill or tap two holes at one time. The two spindles adjust to drill or tap a wide variety of hole patterns in a 2-in. diam circle. Heat-treated gearing drives the spindles. This gearing is combined with full ball-bearing drive and friction bearing spindles. This makes the unit a sturdy production tool. For multiple tapping, the unit couples to any of three of the manufacturer's tapping heads. (Commander Mfg. Co.)

For more data circle No. 26 on postcard, p. 73



Conversion Kits Hold Down Relay Inventories

Small 600-v, 10 amp relays feature the building block principle. They find wide use in steel mills, machine tools and control boards of various types and for general purposes. The new small elements are inter-changeable and color-coded. They permit the user to change existing circuits quickly or make exact replacements without waiting for a whole new relay assembly. Another of its benefits is less control board space used. A smaller inventory of parts can be carried. A chart shows how to use the color-selective conversion kits. Among the thirty conversion kits offered, several thousand combinations are possible. (Clark Controller Co.)

For more data circle No. 27 on postcard, p. 73

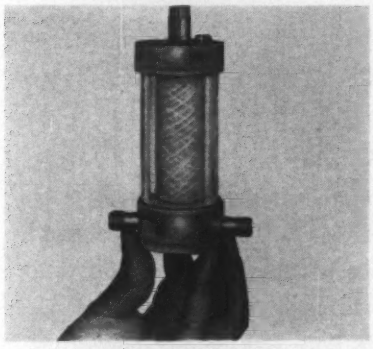
Positioner Increases Power-Press Production

Reducing accident potential, an adjustable safety press block also shortens down time of power presses. The device insures maximum support of power presses during die servicing operations. The safety press block rapidly snubs upper and lower dies while personnel is cleaning, changing or sharpening dies. The device consists of three parts. A single base casting, with integral handle, houses a steel screw. The top of the screw is knurled for easy hand adjustments while on the press. The press block attaches to the press with a short length of chain and safety plug. It is impossible to use the block before removing the plug from its position in the power control panel. (Duff-Norton Co.)

For more data circle No. 28 on postcard, p. 73

Filter Chambers

Miniature filter chambers, for filtering small volumes of corrosive chemicals, are only 5-in. high and 2-in. in diam. They weigh about 8 oz. The filter chambers have a



filtering capacity of 5 to 7.5 gph. Filtration can be viewed through the clear lucite or pyrex shell of the chamber. The chambers can also filter solvents. (Sethco Mfg. Corp.)

For more data circle No. 29 on postcard, p. 73

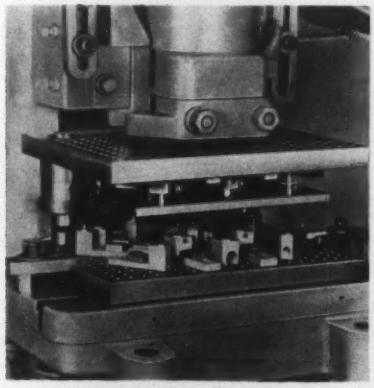
Automatic Stock Reel

For use by stamping plants producing small metal stampings from small coils, a 16-in. horizontal stock reel is fully automatic. The platen is ball-bearing mounted. It is powered by the natural spring action of the uncoiling stock. (Jaco Devices, Inc.)

For more data circle No. 30 on postcard, p. 73

Punch and Die Set

Shown in a press is an assembled punch and die set. Each individual die holder has a self-cleaning slug



chute. This eliminates the need to bore holes in bolster plate. Additional punches and dies can be added to an existing setup without removing the die set from the press. This is due to the fact that clearance holes, tapped from the inside of the die set for ⅜-in. socket screws, are provided. All tooling is reusable. (O'Neil-Irwin Mfg. Co.)

For more data circle No. 31 on postcard, p. 73

Nylon Nut

A nylon hex screw nut comes in a range of sizes. They are: 2-56, 4-40, 6-32, 10-32, 10-24, 14-20 and ¼-28. The nut is double chamfered and double countersunk for automatic feeding. (Nylogrip Products)

For more data circle No. 32 on postcard, p. 73

NEW BOOKS

"Chipless Machining," by Charles H. Wick, describes the various production methods for the cold working of steel — moving metal rather than removing it. It was designed as a comprehensive guide for manufacturing engineers in planning and tooling for chipless machining by cold extrusion, radial forging, spline forming and explosive forming. 502 pp. $10.00 per copy. The Industrial Press, 93 Worth St., New York 13.

"Steel Castings Handbook" takes into consideration the viewpoint of the designer and user of steel castings. It is a comprehensive source of data on the proper design, selection and heat treatment of steel castings. Advantages, as well as the application of steel castings, reveal the many reasons for their use. The chapters in the book also profusely illustrate both their long life in dynamic service and many new applications of the past decade. A separate chapter considers purchasing in detail. There is also a well-balanced chapter on patterns. The manufacture of steel castings is briefly described in the book also. Steel Founders Society of America, 606 Terminal Tower Building, Cleveland 13.

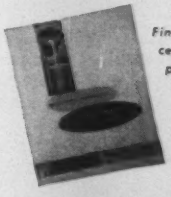
"the HITCHINER way..."

allows flexibility in design with INVESTMENT CASTING

This part is a carrier for a stripper on a citrus peeling machine. It is typical of thousands of irregularly shaped components that are designed with only a particular function in mind and no compromise with production limitations. This type of metal part often requires several changes before the design is finalized.

A late design change in this part, cast in 303 stainless steel, incorporated a 45° bevel, top and bottom on both sides of the serrated pad section. The tooling was altered at very little cost while the cost of the finished casting was not increased at all. The relatively low cost of tooling and tooling changes make the investment casting process an economical and flexible method.

Flexibility in design, a wide freedom of choice in alloy and the elimination of expensive machining operations made possible with the investment casting process may help you solve your parts problems. Send us your sample or blueprint and find out with a Hitchiner "engineered quotation" — no obligation.



Find out how our new ceramic shell technique can possibly benefit you. Send for our free, new revised brochure on the latest investment casting methods.

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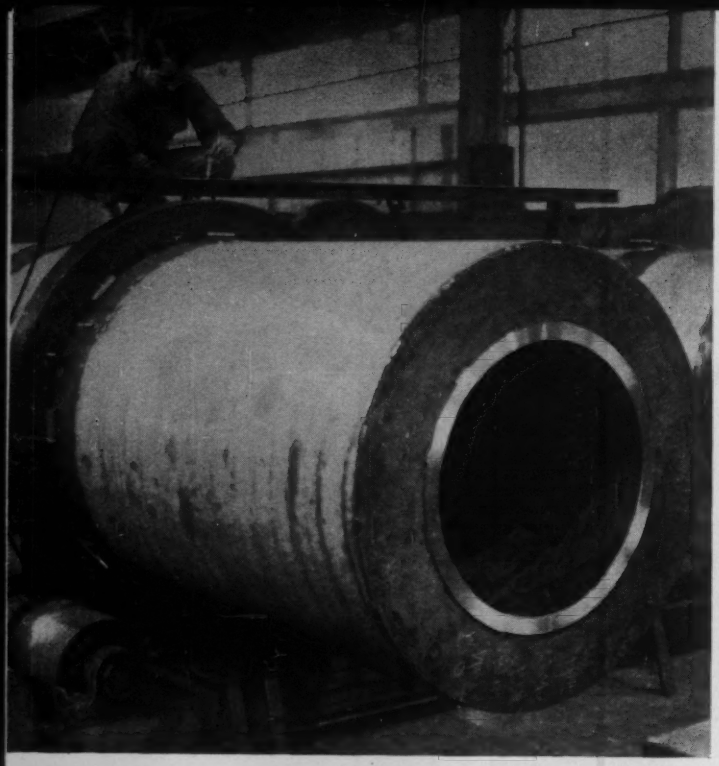
Coast to Coast Engineering Representatives



... HOT

Temperature in this stainless steel rotary salt dryer will be 1600°F from combustion gases. It's used to demoisturize salt, one step in making high octane gas. C. O. Bartlett & Snow was the fabricator. They chose stainless steel because of its outstanding high temperature strength and resistance to high temperature oxidation.

COLD...

—443°F is only 16.4 degrees above absolute zero. That's one reason stainless steel is used in this heat transfer unit that helps simulate outer space conditions of near absolute zero temperature and one-billionth of an atmosphere. The all-stainless unit is named "PLATE-COIL," manufactured by Tranter Manufacturing, Inc., Lansing, Michigan.

USS Stainless Steels... no other metal makes such a material difference in so many applications

This mark tells you a product is made of modern, dependable Steel.

...and in between

No material can match stainless steel's versatility. Stainless steel offers designers and fabricators a unique combination of properties: superior strength, extraordinary corrosion resistance to an enormous variety of reagents, outstanding high temperature properties, and appearance. It is easily fabricated and, because stainless steel lasts longer, actually costs less in the long run. If you have a selection or delivery problem, ask your USS representative or nearest steel service center.

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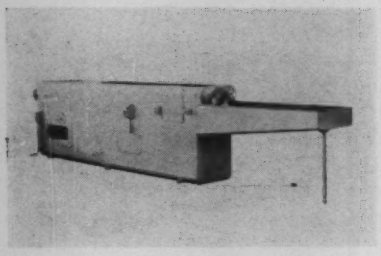
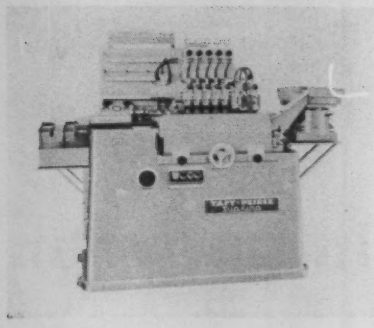
New Equipment and Machinery



Horizontal Broaching Machine Has Large Capacity

A horizontal broaching machine has a capacity of 15 tons and up to 60 in. of cutting stroke. Full-variable cutting speeds up to 22 fpm and 60 fpm return stroke permit very high speed production. The broach uses a heavy, rigid, chassis-type construction. It is fully contained in an all-steel housing. The machine offers rapid set up of either short or long runs. It is adaptable for surface or internal broaching. (Pioneer Broach Co.)

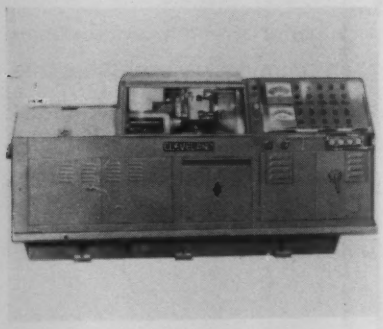
For more data circle No. 33 on postcard, p. 73



Machine Gives Fractional Microinch Finishes

At the same time, a microstoning machine corrects geometric inaccuracies on cylinders while producing fractional microinch finishes. Cylinders can range in size from 3/16 to 2⅜ in. in diam. It produces finished parts in seconds, unattended. The heart of the machine consists of five stone guides and two heat-treated and ground rolls. These rolls feed the work beneath the stones. Five different operations, from coarse abrading to fine polishing, can be carried out in sequence. Roll speed is infinitely variable to give any work-feed rate between 10 and 60 ipm. Controls are simple and conveniently located. (Taft-Peirce Mfg. Co.)

For more data circle No. 34 on postcard, p. 73



Bar Automatic Has Knob-Set Speed and Feed Rates

Exact spindle speeds and turret tool feeds are set with a twist of the wrist on a single-spindle bar automatic. The programming panel contains every control necessary for setting of spindle speeds and turret feeds. There is a knob for each of the five turret positions. The rates are indicated on monitor dials. The precise feeds and speeds selected will repeat accurately, cycle after cycle, until changed. An infinitely-variable spindle-speed range is from 40-3100 rpm. The turret tool feeds may be adjusted while the tools are cutting. This obtains maximum efficiency for every operation. Idle motion time is 8 seconds. (The Cleveland Automatic Machine Co.)

For more data circle No. 35 on postcard, p. 73

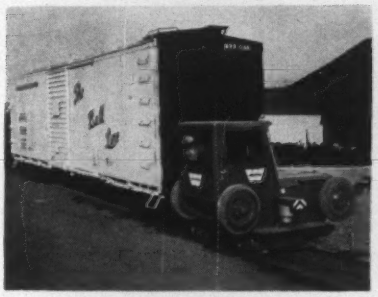
Machine Produces Bends to Close Tolerances

Projecting quality cold bending into a vast new area, three machines of a new line handle from ½- to 4-in. iron-pipe-size pipe. The machines are designed for low production, one-of-a-kind or experimental parts. The two larger machines in the line feature direct hydraulic operation of the pressure dies. All machines in the line can be easily and inexpensively tooled to bend structural shapes, solid stock and rolled or extruded sections. Also included are pipe and tubing. Another of the models has an invertible top assembly with double tool holder ways. These permit fast, two-minute changeover from clockwise to counter-clockwise bending. Any model can receive a hydraulically-operated mandrel extractor for use on small radius work. (Pines Engineering Co., Inc.)

For more data circle No. 36 on postcard, p. 73

Rail or Road Vehicle

A vehicle has road-to-rail and rail-to-road convertibility. With its ability to go practically anywhere, it is not limited to switching duties. It spots railroad cars but it can also haul crates. It also plows snow—off the rails or off the highway. It

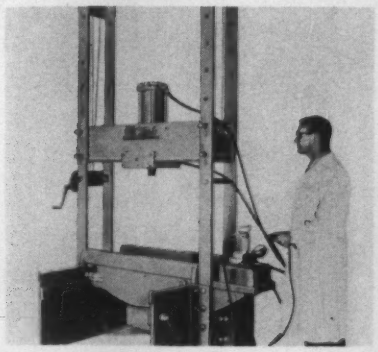


parks anywhere. Its rail wheels lower hydraulically. (Whiting Corp.)

For more data circle No. 37 on postcard, p. 73

Hydraulic Shop Presses

Rugged 50- and 100-ton "roll-bed" hydraulic shop presses incorporate double-acting, heavy-duty cylinders. High-speed, two-stage pumping units give faster, more efficient pressing operations. The "roll-



bed" feature permits safe, easy loading and unloading of hard-to-handle work outside of press frame. The hydraulic cylinders are for operating pressures up to 10,000 psi. Stroke length can be specified. (Owatonna Tool Co.)

For more data circle No. 38 on postcard, p. 73

Steel Mill Loader

A steel mill loader has the operator positioned high towards the rear of the machine. Because of this, it is possible for the massive bucket to be working in open-hearth cleanout, while the operator position leaves him either outside of the furnace or the maximum distance from the heat and fumes

within the furnace area. This machine features special reinforced bucket and rail guards. Some of the machine's design features include: center mounting of the engine; finger-tip control; spin turn maneuverability. (The Eimco Corp.)

For more data circle No. 39 on postcard, p. 73

HOW LONG SINCE YOU CHECKED ON PERFORATIONS?

No matter what material your product demands Mundt can supply the exact perforation you need. Steel, brass, copper, monel, bronze, aluminum, zinc, tinplate, lead, stainless steel, coated metals, bonded materials, plastics, and paper are punched as required for every functional and ornamental need.

You can count on Mundt's guarantee that sheets are perfectly flat, straight, parallel on the sides, and free from buckle or camber.

Our modern tool and machine shop is constantly making new dies to add to the tremendous variety of screens available. If you have a special problem we'll gladly supply design and metallurgical assistance.

No job is too small for our careful, personal attention . . . or too large for prompt delivery. Mundt's 90 years' experience is at your disposal.

Write for Free Catalog

CHARLES MUNDT & SONS

53 FAIRMOUNT AVENUE, JERSEY CITY 4, N. J.

PERFORATING SPECIALISTS FOR ALL TYPES OF MATERIALS

HAYWARD ELECTRIC MOTOR BUCKETS

Work Longer, Work Faster, Wear Less!

Hook onto any electric over-head crane . . . need no latches, hand lines, ropes or limit switches . . . can't discharge accidentally while being traversed . . . operates without need of circuit breakers . . . motor enclosed against dust, soot and weather . . . steel and bronze construction . . . can operate in pits or high-sided cars . . . *plus many other cost-cutting design features!*

Write for illustrated bulletin giving complete details including sizes, weights and dimensions.

THE HAYWARD COMPANY

50 CHURCH ST., DEP'T 1, NEW YORK 7, N. Y.

Builders of Better Buckets Since 1888

How to step up the output of your air tools

Are you wasting valuable production man-hours with a weak compressed air system? Here's how to make *sure* you get top output with air tools . . .

The experienced application engineers of Cooper-Bessemer and Rotor Tool will help you analyze your entire air system. This study includes compressor capacity needs, compressor location for greatest operating economy, air pressure regulation, the distribution system and portable tools. There is no obligation.

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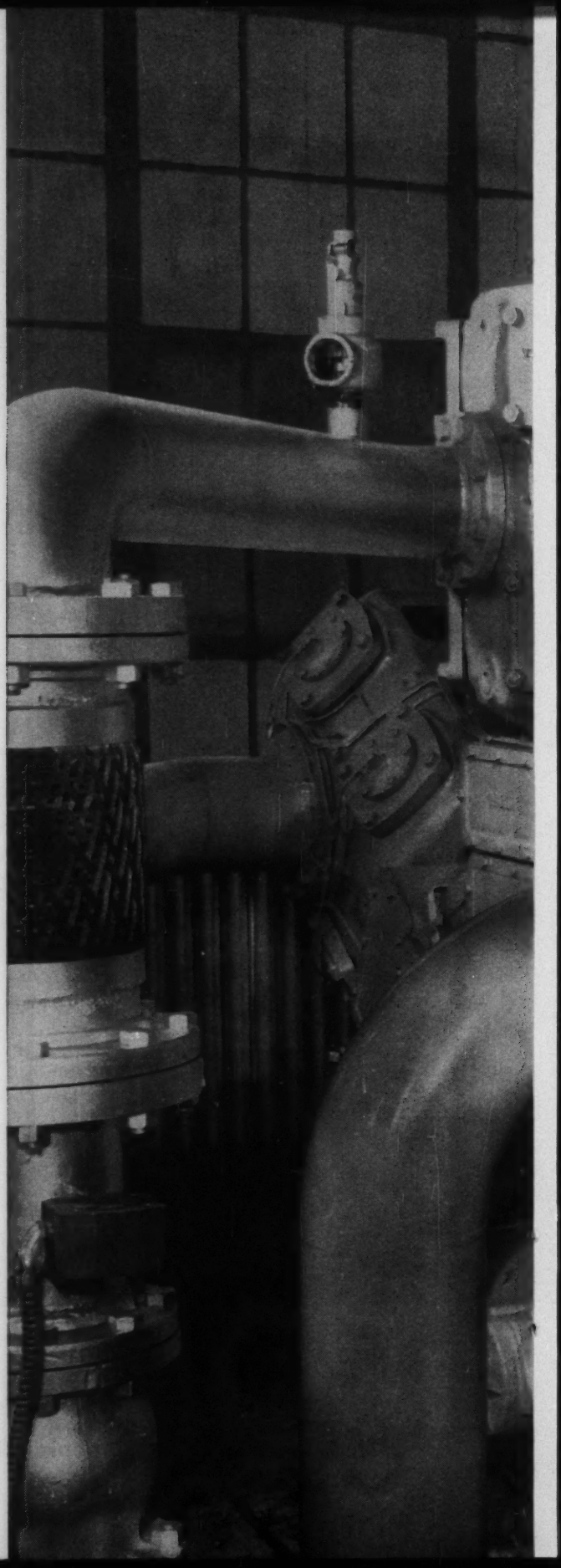
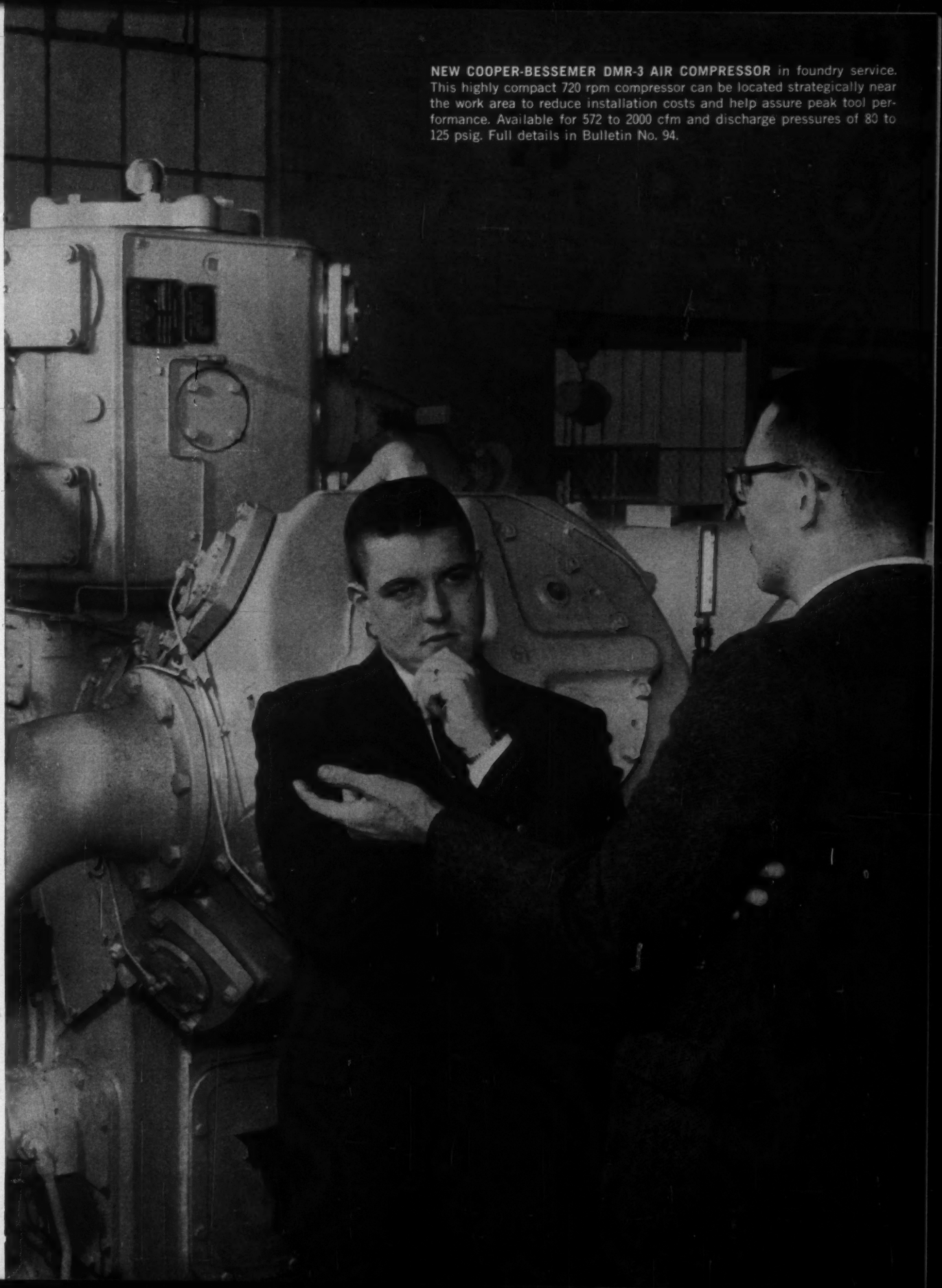
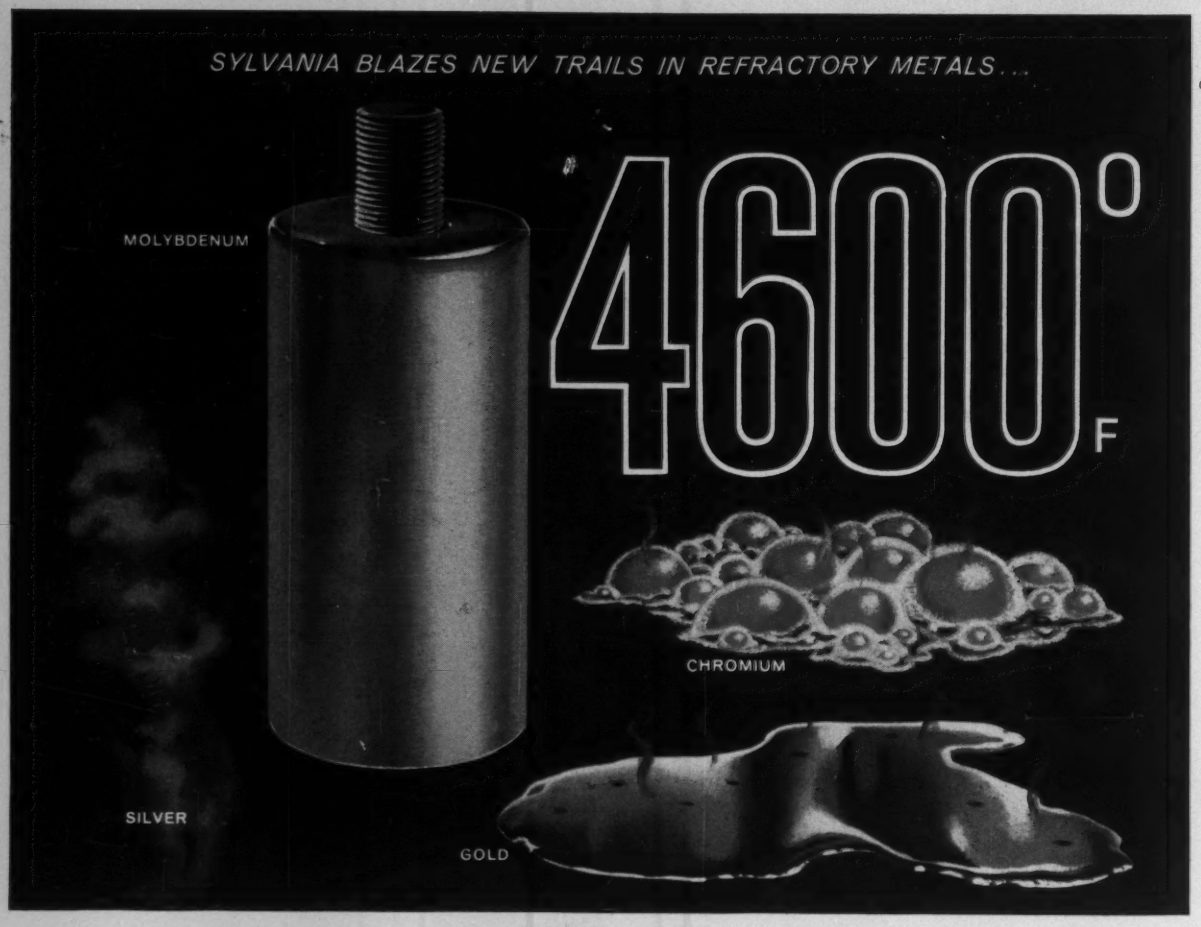




NEW COOPER-BESSEMER DMR-3 AIR COMPRESSOR in foundry service. This highly compact 720 rpm compressor can be located strategically near the work area to reduce installation costs and help assure peak tool performance. Available for 572 to 2000 cfm and discharge pressures of 80 to 125 psig. Full details in Bulletin No. 94.



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A Mild Pickup for January

After the 20-year low point expected over the holidays, January will show a better volume.

But the picture isn't without its gloomy spots. New cutbacks have hit the auto industry. Result: The pickup may be less than expected.

■ Next week, the period between Christmas and New Years, will see the lowest steel tonnage produced in a non-strike period since the late 1930's.

Many mills will shut down completely between the two holidays and most will curtail operations over the weekends, shutting down a few days before each holiday.

How Much Pickup?—The cumulative effect of low December business and the seasonal shutdowns will at least set the stage for a January improvement. The mills continue to get an optimistic playback from January orders for sheet, plates and structurals. These products will be better next month. Tinplate orders are up after the seasonal slowdown.

However, the evidence of a January improvement is inconclusive now. The present order rise is not big enough in most markets to indicate much more than a recovery from December's letdown. There are regional factors to consider. For example, Cleveland mills expect a 10 pct improvement in January, probably an optimistic viewpoint compared with the rest of the country.

Still to Come—In addition, the biggest part of January tonnage has yet to be placed. Standard pipe, oil country seamless, galvanized sheet, wire and stainless strip are all available out of finished stock. These products are now ordered on a day-to-day basis.

For bars, plate, and structurals, the biggest part of a month's tonnage does not come in until the last week of the month. More than 20 pct of bar orders come in after the start of the month.

Auto Cutbacks — Clouding the picture is news of more cutbacks from Detroit. This week it is confined to Chrysler Corp., which reportedly is taking 57,000 cars out of its first quarter production schedule. About two weeks ago, the same company took 23,000 cars out of the first quarter. This is more than a full month's production at the October-November rate.

One supplier says it was told to hold all Chrysler releases of steel orders for two weeks pending clarification of the cutbacks. As it stands now, half of December's Chrysler buy is wiped out.

A Look Ahead—So far, General Motors Corp., and Ford Motor Co. seem to be holding to their January schedules. And, there are still some plants on overtime, although the number is dwindling. One Corvair plant worked only three days in a recent week and the auto industry, like steel, will be hit by some extra-long holiday shutdowns.

This is what can be expected in the immediate post-holiday period.

A rebound from the seasonal slump; better orders from users with low or unbalanced inventories; and a pickup not as strong as original hopes for after-the-first-of-the-year.

Steel Output, Operating Rates

	This Week	Last Week	Month Ago	Year Ago
North East Coast	45.0	49.0*	47.0	98.0
Buffalo	40.0	41.0	49.0	98.0
Pittsburgh	43.0	47.0*	46.0	96.0
Youngstown	36.0	37.0*	27.0	87.0
Cleveland	40.0	44.0*	54.0	94.0
Detroit	57.0	63.0*	67.0	102.0
Chicago	52.0	53.0*	53.0	96.0
Cincinnati	55.0	55.0*	54.0	81.0
St. Louis	61.0	62.0*	50.0	83.0
South	55.0	45.0*	52.0	91.0
West	50.0	53.0*	46.0	90.0
U. S. Rate	46.9	48.7	48.0	93.3

*Revised
Source: American Iron And Steel Institute

Steel Output, Composite Prices

Production	This Week	Week Ago	Month Ago	Year Ago
(Net tons, 000 omitted)	1,335	1,387	1,367	2,641
Ingot Index				
(1947-1949=100)	83.1	86.3	85.1	164.4
Composite Prices				
Finished Steel, base (cents per lb)	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.32	$66.32	$66.32	$66.41
Scrap No. 1 hvy (Gross ton)	$28.50	$28.50	$28.33	$41.17
No 2 bundles	$18.83	$18.50	$18.50	$27.83

Tool and Die Activity Is Slow

The closing months of this year have been slow ones for the tool and die industry as a whole.

And early 1961 doesn't appear to be holding any signs of an upswing.

■ Activity in the tool and die industry has been dwindling since the middle of the year. As of September, according to the National Tool & Die Manufacturers Assn., many indexes were down from a year earlier.

Orders received were 21 pct below September, 1959; order backlog was down 20 pct to its lowest September level in two years; direct labor man-hours worked were 3 pct lower than a year earlier.

Although sales invoiced were 19 pct higher than in September, 1959, and employment was up 1 pct, the outlook was one of growing pessimism.

Bargain Prices—As a result, purchasers of tools and dies today can find skilled shops to promise quick delivery of orders at bargain prices. Nowhere is this more true than in the Detroit area.

"Our shops can handle an order as soon as it comes in," says C. A. Cahn, managing director of the Detroit Tooling Assn. The organization has 160 tool and die shop members which handle about 35 pct of the country's tool and die work.

Mr. Cahn says DTA shops have a great deal more time and capacity on their hands now than they had last December. In the next four months, 5.25 million hours of shop time will be available. In the course of a year, about 40 million hours are open.

A Buyer's Market—Prices have gone down along with the amount of work. "It's a buyer's market," reports Mr. Cahn. "Rivalry is keen throughout the country. Bidding is extremely competitive, and it's reflected in prices which are lower now than they've been all year."

If there is a price change, it will be up, Mr. Cahn warns. A steel price hike, for example, would likely be followed by higher tool and die costs.

The automobile industry is a major factor in the current depressed state of the tool and die market. Tool and die orders from automakers are coming in slowly this year. When the major orders do come, they are expected to be fewer than last year. Changes on 1962 models are not expected to be as great as on 1961 cars.

A Good Year—Even though the last half of 1960 has been disappointing, shops of the DTA will do slightly better in 1960 than 1959 for the year as a whole. The first half of 1960 was exceptionally good and will manage to offset a very poor last half.

But the outlook for early 1961 is not encouraging to those in the trade. "Whether it's greater dispersal of available business, fewer model changes or simply a slowdown in getting tooling programs underway, I don't know," says Mr. Cahn. But as of today there are not many signs of encouragement pointing toward early 1961."

DEPRESSED SALES: The tool and die industry is suffering from depressed sales at the present time. Automakers, one of the industry's largest buyers, are now planning on spending much for new equipment to prepare for 1962 style changes. This is a rear fender draw die in action in Detroit.

Aren't you glad they look well-fed?

There's a tradition among relief agencies that pictures of starving kids touch more hearts and open more purses. As a matter of fact our files are bulging with such pictures. But for a change isn't it good to see the *results* of your generosity?

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Users Take Time Out For Holidays

There's little activity in the steel market, and not much can be expected for a while.

Some steel users are using the holidays as excuses for postponing decision-making.

■ There are few signs of strength in the market, yet there is some optimism that things will pick up after the first of the year.

Many users say that as long as mills are able to offer fast delivery (See Steel Summary, p. 85), they are going to wait until the holidays are out of the way before making final decisions on whether or not to step up buying.

Holiday Wait — Undoubtedly, there are other reasons for the delay. Year-end inventory taxes are getting a little more attention than is usual when industry is active. Every dollar saved will help; every dollar spent unnecessarily will hurt.

And some procrastination can probably be found as well. At this time of the year there is a natural tendency to put off decision-making. And by stalling a little longer, companies believe they will come up with a clearer picture of the economy and in which direction it will move.

In any event, little activity can be expected for the next several weeks.

Sheet and Strip — Automotive bookings have taken a beating in the past week due to setbacks and cancellations, particularly by Chrysler Corp. in Detroit. Latest move by Chrysler brings to 80,000 the number of units the company has cut from first-quarter schedules in recent weeks. It is slightly more than a month's production at the current rate. So far, there are no indications that the other automakers plan sharp rollbacks in the first quarter.

Auto demand is still supporting the **Cleveland** flat-rolled market. And the outlook for January is for an increase of about 10 points in the operating rate over December. Even so, this would only take it up to about 50 pct of capacity. And there has been a tendency toward greater weakness in hot-rolled sheet demand in recent weeks. Customers are fussier and more is being rejected.

A **Pittsburgh** producer notes a better tone from cold-rolled sheets, but not enough to bring a decisive production boost. Galvanized is being delivered out of stock to a large extent, and mills won't know about January until they are into the month. It is believed users are holding back until the start of the year.

PURCHASING AGENT'S CHECKLIST

What's ahead for the tool steel industry—an IRON AGE interview with Latrobe Steel's president J. E. Workman. P. 27

Starting next month steel's output will not be reported as percent of industry's capacity by AISI P. 30

New aluminum process coming from Aluminium, Ltd. P. 33

Sheet and strip are dragging along the **East Coast.** Users are buying only what is needed to fill inventory holes or for emergency delivery. Year-end inventory taxes are causing some to hold off orders. There's no strong advance ordering going on in the **Midwest.** And producers say **Chicago** mills should be able to give two-week delivery through the end of January.

Bars—It's too soon to have a good picture of January bar orders. Customers are placing much of their tonnage in the last week of the preceding month, so they still have another week to go. About 20 pct of the bar tonnage is ordered after the start of the month. In some cases, this is even higher. **Pittsburgh** mills report many instances where plants have held up normal December orders until after the first of the year. Some mild gains have been noted from farm equipment manufacturers in the **Midwest.** But optimism is tempered by cutbacks from construction equipment manufacturers and the fact that automotive orders are only holding steady.

Tinplate—Shipments continue to lag more than seasonally. January orders indicate a pickup, but certainty is confused by heavy carryover stocks. **Pittsburgh** mills have a lot of tinplate on hand that was ordered months ago. The speed of any upturn will be determined by when canmakers release this tonnage.

Pipe and Tubing—Reversing the normal seasonal pattern, November and December have been better months than September and October, according to **Pittsburgh** mills. And at least for one producer, merchant pipe has held firm in the face of a general lag and seasonal forces.

Plates — As users' inventories have dwindled below the danger point, **East Coast** mills have noticed a slight pickup in carbon plate orders. Most active markets are road-building, bridges and shipyard work. But January orders still aren't strong. However, **Pittsburgh** mills say the big upturn for heavy steels isn't expected until March.

COMPARISON OF PRICES

(Effective Dec. 20, 1960)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Dec. 20 1960	Dec. 13 1960	Nov. 21 1960	Dec. 22 1959
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plates (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wires: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 10 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

	Dec. 20 1960	Dec. 13 1960	Nov. 21 1960	Dec. 22 1959
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.11	$70.11	$70.11	$70.57
Foundry, South Cin'ti	71.92	71.92	71.92	73.37
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	69.61	69.61	69.61	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb.‡	11.00	11.00	11.00	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.32	$66.32	$66.32	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$26.50	$26.50	$26.50	$42.50
No. 1 steel, Phila. area	33.50	33.50	33.00	41.50
No. 1 steel, Chicago	25.50	25.50	25.50	39.50
No. 1 bundles, Detroit	21.50	21.50	21.50	38.50
Low phos., Youngstown	28.50	28.50	28.50	48.50
No. 1 mach'y cast, Pittsburgh	44.50	44.50	45.50	55.50
No. 1 mach'y cast, Phila.	47.50	47.50	47.50	54.50
No. 1 mach'y cast, Chicago	41.50	41.50	41.50	60.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$28.50	$28.50	$28.33	$41.17
No. 2 bundles	18.83*	18.50	18.50	27.83
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.50-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	30.00	30.00	30.00	33.00
Copper, Lake, Conn.	30.00	30.00	30.00	33.00
Tin, Straits, N. Y.	101.50†	101.875	103.25	99.00
Zinc, East St. Louis	12.50	13.00	13.00	12.50
Lead, St. Louis	11.00	11.80	11.80	12.30
Aluminum, ingot	26.00	26.00	26.00	26.80
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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*Appears in the Dec. 15-Dec. 29 issues.

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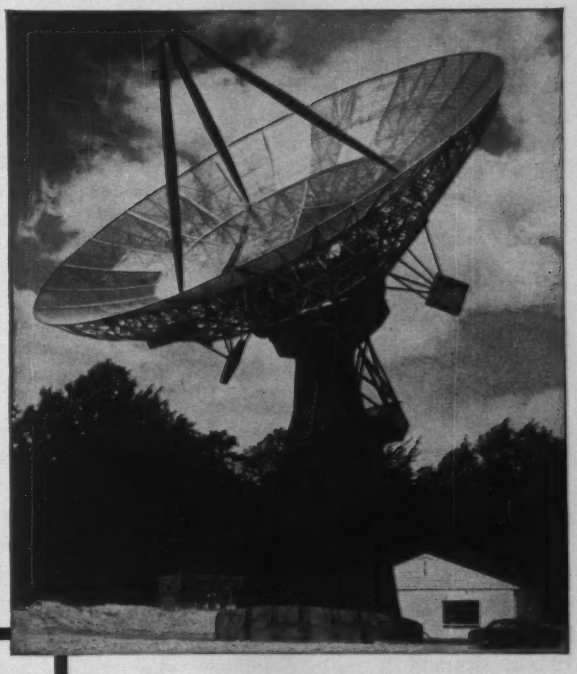

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East Coast Strengthens

The snow and freezing temperatures that deadened East Coast areas last week have strengthened this week's market.

Dealers who are able to get scrap to the docks are drawing premium prices.

■ The snow and freezing weather, which deadened East Coast port areas last week, have resulted in a somewhat stronger market in these areas this week.

New York and Philadelphia, chief export areas in the East, have ships loading. But bogged-down transportation facilities have made yard - to - dock shipping difficult. Those dealers that are able to get tonnage to the ports are selling at premium prices.

The overall scrap market has a slightly firmer tone this week. However, many dealers are allowing inventories to build up with hopes of higher prices next month. Yet most consumers are still unwilling to pay higher prices.

The IRON AGE composite price for No. 1 heavy melting remains unchanged again this week at $28.50. However, the composite price for No. 2 bundles is up to $18.83 from last week's $18.50.

Pittsburgh—Pressure for higher prices continues to mount. Anticipation of a stronger January market has dealers resisting current prices. Export demand is pushing inland with bids for scrap reaching areas to the east and south. Export strength has tended to isolate the district. Local railroad scrap was sold for nearly $10 under the top price bid for export. All this has tightened local supply, but it has not yet brought higher prices from consumers. One mill is offering $21 for No. 2 bundles. The same price is being paid on an old order by another mill. With the present mood of dealers, these prices have produced a market deadlock.

Chicago — Scrap continues on tight supply, but no important price advances are reported. Yards continue to allow scrap inventories to build up in anticipation of stronger first quarter price levels. Railroad scrap continues to move out of the district. Trading locally is very quiet. Scattered reports of increased foundry buying are not enough to boost this market, though electric furnace grades are difficult to purchase at current prices. The general outlook, for scrapmen, continues to be mildly optimistic.

Philadelphia — The market is somewhat firmer because of the snow which deadened activity here last week. Dealers report that there are several ships waiting to load and tonnage is lacking because of shipping problems from yards to the ports. Those that can get grades to the docks are selling at premium prices. However, this is not representative of the market and there are no price changes.

New York—Almost a week of inactivity, because of snow and freezing weather, has put a small degree of strength into this market. But it's only to the extent that, this month, four weeks worth of loadings will be done in three weeks. It's all export. And the strength is nowhere near enough to affect prices.

Detroit—Some brokers are predicting a tussle between domestic and export scrap buyers next month. Both the Japanese and Europeans are apparently finding Detroit prices interesting. There are estimates that between 75,000 and 100,000 tons were taken out of the market in December and laid down for spring shipment overseas.

Cleveland — Some specialty grades such as cut structural steel have gone up in price recently. But the market is generally listless. Yards have bled off most of their best grades. Production lists still overhang the market.

Cincinnati—The next few weeks will be a critical test of market strength in this area. Brokers who are forced to cover old orders must pay dealers more to get it. And any large order would probably command a higher price.

St. Louis—The firmer tone that crept into this market last week has become more prominent. A brief flurry in turnings sent these prices $1 higher. Also, some railroad grades are in demand and have edged $2 upwards.

Birmingham — Scrap movement this week is negligible. Consumers are holding down inventories but admit they are getting low and indicate they will be buying early next year. A railroad list closing this week was slightly higher.

Buffalo—The market is again at a standstill and there are no price changes.

Boston — A substantial pickup has been noted in exports, but domestic business is dead. There are no price changes.

West Coast—The important domestic scrap buyers feel prices will go up once they enter the market. How much will depend on tonnage. All along the coast, export remains the only activity at present.

Houston — The market remains unchanged with export operations supplying the prop.

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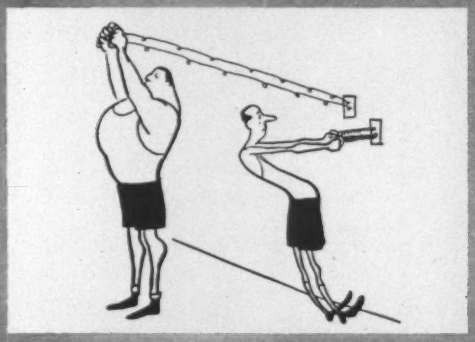
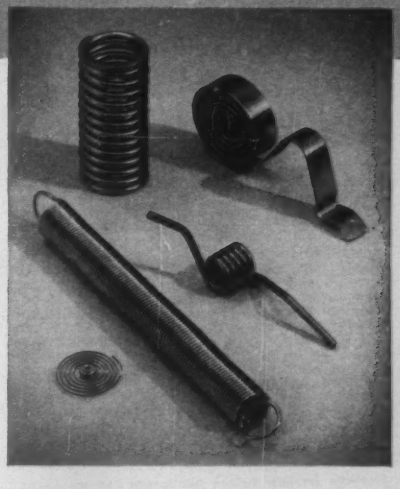


EXECUTIVE COILS

SAFARI COIL



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SCRAP PRICES *(Effective Dec. 20, 1960)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	27.00 to 28.00
No. 1 factory bundles	31.00 to 32.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	26.00 to 27.00
Machine Shop turn.	11.00 to 12.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	15.00 to 16.00
Low phos. punch'gs plate	33.00 to 34.00
Heavy turnings	23.00 to 24.00
No. 1 RR hvy. melting	31.00 to 32.00
Scrap rails, random lgth	40.00 to 41.00
Rails 2 ft. and under	45.00 to 46.00
RR Specialties	38.00 to 39.00
No. 1 machinery cast.	44.00 to 45.00
Cupola cast.	35.00 to 36.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	85.00 to 90.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 dealer bundles	26.00 to 27.00
No. 1 factory bundles	30.00 to 31.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	25.00 to 26.00
Machine shop turn.	10.00 to 12.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Low phos. forge crops	36.00 to 37.00
Low phos. punch'gs plate, ¼ in. and heavier	33.00 to 34.00
Low phos. 2 ft. and under	31.50 to 32.50
No. 1 RR hvy. melting	29.00 to 30.00
Scrap, rails, random lgth	37.00 to 38.00
Rerolling rails	49.00 to 50.00
Rails 2 ft. and under	42.00 to 43.00
Angles and splice bars	38.00 to 39.00
RR steel car axles	50.00 to 51.00
RR couplers and knuckles	35.00 to 36.00
No. 1 machinery cast.	41.00 to 42.00
Cupola cast.	36.00 to 37.00
Cast iron wheel	27.00 to 28.00
Malleable	40.00 to 41.00
Stove plate	31.00 to 32.00
Steel car wheels	35.00 to 36.00
Stainless	
18-8 bundles and solids	165.00 to 170.00
18-8 turnings	85.00 to 90.00
430 bundles and solids	80.00 to 85.00
430 turnings	45.00 to 50.00

Philadelphia Area

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	12.00 to 13.00
Mixed bor. short turn.	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	18.00 to 19.00
Clean cast, chem. borings	23.00 to 24.00
Low phos. 5 ft and under	35.00 to 36.00
Low phos. 2 ft punch'gs	38.00 to 39.00
Elec. furnace bundles	34.00 to 35.00
Heavy turnings	25.00 to 26.00
RR specialties	36.00 to 37.00
Rails, 18 in. and under	47.00 to 49.00
Cupola cast.	36.00 to 37.00
Heavy breakable cast.	36.00 to 37.00
Cast iron car wheels	37.00 to 38.00
Malleable	45.00 to 46.00
No. 1 machinery cast.	47.00 to 48.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$23.50 to $24.50
No. 2 hvy. melting	20.50 to 21.50
No. 1 dealer bundles	24.50 to 25.50
No. 2 bundles	16.00 to 17.00
Machine shop turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	10.00 to 11.00
Low phos. 18 in. and under	31.00 to 32.00
Rails, random length	35.00 to 36.00
Rails, 18 in. and under	43.00 to 44.00
No. 1 cupola cast	34.00 to 35.00
Hvy. breakable cast.	28.00 to 29.00
Drop broken cast	41.00 to 42.00

Youngstown

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	21.00 to 22.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	16.00 to 17.00
Low phos. plate	28.00 to 29.00

Cleveland

No. 1 hvy. melting	$23.50 to $24.50
No. 2 hvy. melting	17.00 to 18.00
No. 1 dealer bundles	23.50 to 24.50
No. 1 factory bundles	27.00 to 28.00
No. 2 bundles	16.50 to 17.50
No. 1 busheling	23.50 to 24.50
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Cut structural & plates, 2 ft. & under	32.50 to 33.50
Low phos. punch'gs plate	24.50 to 25.50
Drop forge flashings	23.50 to 24.50
Foundry steel, 2 ft. & under	25.00 to 26.00
No. 1 RR hvy. melting	28.00 to 29.00
Rails 2 ft. and under	44.00 to 45.00
Rails 18 in. and under	45.00 to 46.00
Steel axle turnings	20.00 to 21.00
Railroad cast.	43.00 to 44.00
No. 1 machinery cast.	43.00 to 44.00
Stove plate	36.00 to 37.00
Malleable	43.00 to 44.00
Stainless	
18-8 bundles	165.00 to 170.00
18-8 turnings	60.00 to 70.00
430 bundles	70.00 to 75.00

Buffalo

No. 1 hvy. melting	$23.00 to $24.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 busheling	23.00 to 24.00
No. 1 dealer bundles	23.00 to 24.00
No. 2 bundles	17.00 to 18.00
Machine shop turn.	9.00 to 10.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	11.00 to 12.00
Low phos. plate	31.00 to 32.00
Structurals and plate, 2 ft. and under	33.00 to 34.00
Scrap rails, random lgth	32.00 to 33.00
Rails 2 ft. and under	42.00 to 43.00
No. 1 machinery cast.	42.00 to 43.00
No. 1 cupola cast.	36.00 to 37.00

St. Louis

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	25.00 to 26.00
Foundry steel, 2 ft.	27.00 to 28.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	18.00 to 19.00
Machine shop turn.	7.00 to 8.00
Shoveling turnings	9.00 to 10.00
Cast iron borings	16.00 to 17.00
No. 1 RR hvy. melting	28.00 to 29.00
Rails, random lengths	34.00 to 35.00
Rails, 18 in. and under	36.00 to 37.00
RR specialties	35.00 to 36.00
Cupola cast	38.00 to 39.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	33.00 to 34.00
Cast iron cars wheels	33.00 to 34.00
Rerolling rails	46.00 to 47.00
Unstripped motor blocks	33.00 to 34.00

Birmingham

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	9.00 to 10.00
Electric furnace bundles	32.00 to 33.00
Elec. furnace, 3 ft. & under	32.00 to 33.00
Bar crops and plate	37.00 to 38.00
Structural and plate, 2 ft.	36.00 to 37.00
No. 1 RR hvy melting	31.00 to 32.00
Scrap rail, random lgth	36.00 to 37.00
Rails, 18 in. and under	44.00 to 45.00
Angles and splice bars	36.00 to 37.00
No. 1 cupola cast.	44.00 to 45.00
Stove plate	44.00 to 45.00
Cast iron car wheels	33.00 to 34.00
Unstripped motor blocks	32.00 to 33.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	19.00 to 20.00
No. 2 dealer bundles	14.00 to 15.00
Machine shop turnings	2.00 to 3.00
Mixed bor. and turn.	3.00 to 4.00
Shoveling turnings	5.00 to 6.00
Clean cast. chem. borings	17.00 to 18.00
No. 1 machinery cast.	36.00 to 37.00
Mixed yard cast.	32.00 to 33.00
Heavy breakable cast.	30.00 to 31.00
Stainless	
18-8 prepared solids	160.00 to 165.00
18-8 turnings	80.00 to 85.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$18.00 to $19.00
No. 2 hvy. melting	15.00 to 16.00
No. 1 dealer bundles	21.00 to 22.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	18.00 to 19.00
Drop forge flashings	18.00 to 19.00
Machine shop turn.	6.00 to 7.00
Mixed bor. and turn.	9.00 to 10.00
Shoveling turnings	9.00 to 10.00
Cast iron borings	9.00 to 10.00
Heavy breakable cast.	23.00 to 24.00
Mixed cupola cast.	29.00 to 30.00
Automotive cast.	33.00 to 34.00
Stainless	
18-8 bundles and solids	145.00 to 150.00
18-8 turnings	45.00 to 50.00
430 bundles and solids	50.00 to 55.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$22.00 to $23.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 dealer bundles	22.00 to 23.00
No. 2 bundles	12.00 to 13.00
No. 1 busheling	22.00 to 23.00
Machine shop turn.	3.50 to 4.50
Shoveling turnings	7.00 to 8.00
Clean cast. chem. borings	11.00 to 12.00
No. 1 machinery cast.	37.00 to 38.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	25.50 to 26.50

San Francisco

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	29.00
No. 1 dealer bundles	$27.00 to 28.00
No. 2 bundles	18.00
Machine shop turn.	14.00
Cast iron borings	14.00
No. 1 cupola cast.	46.00 to 48.00

Los Angeles

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	24.00 to 25.00
No. 2 bundles	17.00
Machine shop turn.	12.00
Shoveling turnings	13.00
Cast iron borings	13.00
Elec. furnace 1 ft. and under (foundry)	42.00
No. 1 cupola cast.	37.00 to 38.00

Seattle

No. 1 hvy. melting	$33.00
No. 2 hvy. melting	31.00
No. 2 bundles	21.00
No. 1 cupola cast.	36.00
Mixed yard cast.	31.00

Hamilton, Ont

Brokers buying prices per net ton on cars:

No. 1 hvy. melting	$24.00
No. 2 hvy. melting cut 3 ft. and under	20.50
No. 1 dealer bundles	24.00
No. 2 bundles	17.00
Mixed steel scrap	16.00
Bush., new fact, prep'd	23.00
Bush., new fact, unprep'd	18.00
Machine shop turn.	8.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	30.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	29.00
No. 2 bundles	20.50
Machine shop turn.	8.00
Shoveling turnings	11.00
Cut structural plate 2 ft. & under	$40.00 to 41.00
Unstripped motor blocks	26.00 to 27.00
Cupola cast	33.00 to 34.00
Heavy breakable cast.	25.00 to 26.00

LOOK TO LURIA

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Soft Market Drops Lead, Zinc Prices

Lead and zinc prices yielded to the inevitable and declined late last week.

The price decline had been building up, as stocks soared and a major producer was about to resume strike-bound operations.

■ The relentless pressure of supply and demand finally drove lead and zinc prices down. They had held unchanged for almost one year.

Zinc fell by ½¢ per lb, to 12.50¢ at E. St. Louis, and 13¢ delivered at New York.

Lead dropped by 1¢ per lb, to 10.80¢ at St. Louis, and 11¢ at New York.

The Factors—Demand, sales, and consumption of both metals have, thus far, been unaffected by the lower price.

If anything can be said to have triggered the price drop, it must be reports of the imminent return to work of Bunker Hill Co., a major lead and zinc producer, after a seven-month strike.

With a large portion of capacity down, the market lost ground slowly enough to hold prices. With Bunker Hill back, and demand still sagging, it was obvious to most lead and zinc men the price couldn't hold. As it turns out the report of an approaching settlement was enough.

Building Up—Si Wakesberg, secretary, National Assn. of Secondary Materials Industries, points out that the pressure of the price has been building for almost a year.

Domestic zinc shipments in November were the lowest in four months, he points out. But more significant, the figure of 56,981 tons shipped that month was sharply under the 80,000 ton levels being maintained at the beginning of the year.

Stocks Grow—And, Mr. Wakesberg notes that unsold stocks at smelters have grown from 144,471 tons at the end of January, 1960, to 182,149 tons currently.

In lead the situation is similar, possibly even weaker, because lead is rapidly losing one of its major markets—cable sheathing—to plastics. Mr. Wakesberg notes that a U. S. Mines Bureau report shows consumers used 4 pct less lead in September than in August—usually the seasonally slow vacation period.

The soft condition of lead and zinc markets may help get some action in Congress this coming session to aid small domestic lead and zinc miners.

Washington Word — The word from Washington is that basically the same bill, to subsidize small domestic miners, as was vetoed by President Eisenhower will be reintroduced within a week after the session opens.

Sen. Kerr (D. Okla.), will sponsor the Senate bill. There is no word from the House, but Rep. Ed Edmondson (D. Okla.) is likely to be the House sponsor.

Advocates of the bill are optimistic. They were optimistic last session, also. But this time they point out that President - elect Kennedy has promised to help the lead and zinc miners during his campaign.

Aluminum

Advance word from Washington is that the Commerce Dept.'s official aluminum outlook for 1961 is going to be somewhat less optimistic than has been standard in aluminum.

A spokesman reported that the government expects shipments of producers to be about the same as this year, consumption about the same, and a slight drop in exports.

The major problem, said this spokesman, has been evaluating consumer inventories. "No one really knows," he said. "And if our guess is wrong, we could be off base."

In a year-end statement, R. S. Reynolds, Jr., president of Reynolds Metals Co., looks for a gain at mid year in overall business activity. This, he says, should be accompanied by a sharp rise in the aluminum industry.

He contends that customers' inventories are now nearing the bottom, and predicts that during 1961 domestic shipments should increase.

In a similar statement, Alcoa president L. Lichtfield, Jr., says, "Demand remains so strong that we'd be in good shape if price levels were such as to make possible an adequate return on the industry's investment."

Tin prices for the week: Dec. 14 —101.75; Dec. 15—101.625; Dec. 16 — 101.50; Dec. 19 — 101.50; Dec. 20—101.50*

Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum Ingot	26.00	24.70	12/17/59
Copper (E)	30.80	33.00	10/11/60
Copper (CS)	30.00	31.00	10/13/60
Copper (L)	30.00	33.00	10/13/60
Lead, St. L.	10.80	11.80	12/13/60
Lead, N. Y.	11.00	12.00	12/13/60
Magnesium Ingot	36.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/8/58
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	12.50	13.00	12/13/60
Zinc, N. Y.	13.00	13.50	12/13/60

ALUMINUM: 99% Ingot COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices, pg. 95.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.038	.048-.061	.077-.096	.136-.250
1100, 3003	48.4	47.4	46.4	45.4
5052	55.8	53.0	50.8	49.2
6061-0	53.0	50.3	48.4	47.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 1/2
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade		67.9	69.0	77.9	103.1
AZ31B Spec.		93.3	96.9	108.7	171.3
Tread Plate		70.6	71.7		
Tooling Plate	73.0				

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	55.13	.....	52.36	56.32
Brass, Yellow	49.27	49.56	49.21	53.43
Brass, Low	51.75	52.04	51.69	55.81
Brass, Red	52.62	52.91	52.56	56.68
Brass, Naval	54.08	60.39	47.89	58.24
Munts Metal	52.14	.....	47.45	.....
Comm. Bz.	54.03	54.32	53.97	57.84
Mang. Bz.	57.82	.....	51.42	.....
Phos. Bz. 5%	75.70	75.70	76.20	77.63

Free Cutting Brass Rod..... 34.88

TITANIUM

(Base Prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be $65.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $70.00
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.50
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base.... $ 1.31
Cobalt, 97-99% (per lb).... $1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... $29.95 to $36.95
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9% dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz..... $75 to $85
Lithium, 98% ..... $9.00 to $12.00
Magnesium sticks, 10,000 lb..... 57.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $208 to $210
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz...$24 to $26
Platinum, dollars per troy oz...$82 to $85
Rhodium ..... $137 to $140
Silver ingots (¢ per troy oz.)..... 91.375
Thorium, per kg $43.00
Vanadium ..... $ 3.65
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 28.25
- No. 120 ..... 27.25
- No. 123 ..... 26.25

80-10-10 ingot
- No. 305 ..... 32.75
- No. 315 ..... 30.50

88-10-2 ingot
- No. 210 ..... 40.50
- No. 215 ..... 37.25
- No. 245 ..... 32.50

Yellow ingot
- No. 405 ..... 23.50

Manganese bronze
- No. 421 ..... 27.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 24.25-24.50
- 0.60 copper max. 24.00-24.25

Piston alloys (No. 132 type)..26.00-27.00
No. 12 alum. (No. 2 grade)...22.75-23.25
108 alloy 23.25-23.75
195 alloy 25.75-26.75
13 alloy (0.60 copper max.)...24.00-24.25
AXS-679 (1 pct zinc) 23.00-24.00

(Effective Dec. 19, 1960)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 23.75-24.75
Grade 2—92-95% 22.50-23.50
Grade 3—90-92% 21.50-22.50
Grade 4—85-90% 21.00-22.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	26	25¼
Yellow brass	20⅜	18⅜
Red brass	23¼	22½
Comm. bronze	24	23¼
Mang. bronze	19½	18⅜
Free cutting rod ends.	19⅝	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 24¾
No. 2 copper wire 23½
Light copper 21¼
*Refining brass 21½
Copper bearing material 20½
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 24¼
No. 2 copper wire 23¼
Light copper 21
No. 1 composition 19¾
No. 1 cop. turnings 20¼
Hvy. yellow brass solids 15½
Brass pipe 14½
Radiators 16½

Aluminum

Mixed old cast. ..... 12½—13
Mixed new clips ..... 14½—15
Mixed turnings, dry ..... 13 —14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 22 —22½
No. 2 copper wire ..... 20½—21
Light copper ..... 18½—19
Auto radiators (unsweated).. 12½—13
No. 1 composition ..... 17½—18
No. 1 composition turnings... 16 —17
Cocks and faucets ..... 13 —13½
Clean heavy yellow brass ... 12¼—12½
Brass pipe ..... 13½—14
New soft brass clippings..... 13½—14
No. 1 brass rod turnings .... 12½—13

Aluminum

Alum. pistons and struts .... 6½— 7
Aluminum crankcase ..... 8½— 9
1100 (Ss) aluminum clippings 11½—12
Old sheet and utensils ..... 8½— 9
Borings and turnings ..... 4½— 5
Industrial castings ..... 9 — 9½
2020 (24s) clippings ..... 10 —10½

Zinc

New zinc clippings ..... 7 — 7¼
Old zinc ..... 4 — 4½
Zinc routings ..... 3 — 3¼
Old die cast scrap ..... 2 — 2¼

Nickel and Monel

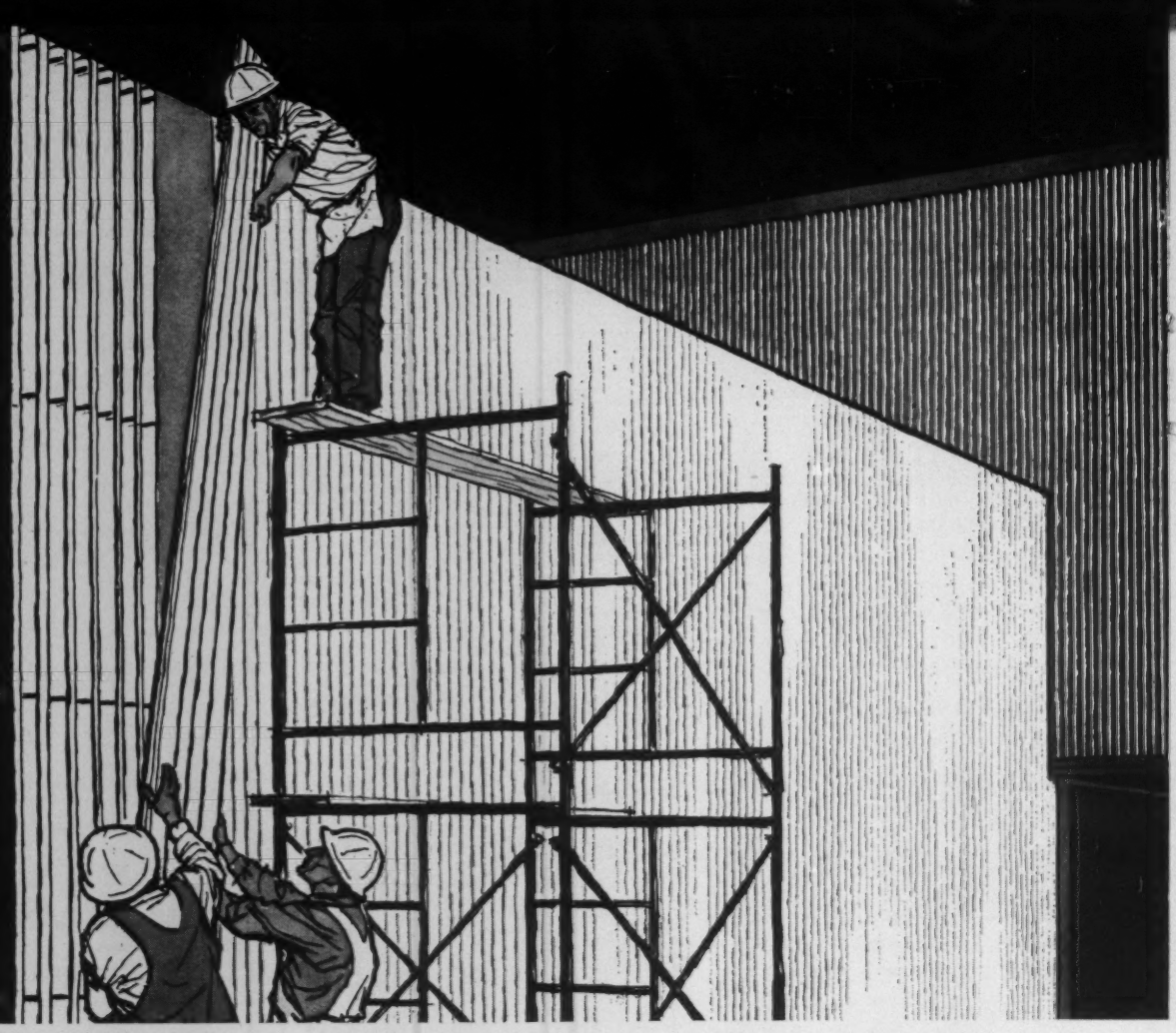
Pure nickel clippings 52-54
Clean nickel turnings 40
Nickel anodes 52-54
Nickel rod ends 52-54
New Monel clippings 23-23.50
Clean Monel turnings 16.50-17
Old sheet Monel 22-23
Nickel silver clippings, mixed. 18
Nickel silver turnings, mixed. 15

Lead

Soft scrap lead ..... 7¾— 8
Battery plates (dry) ..... 3 — 3¼
Batteries, acid free ..... 2 — 2¼

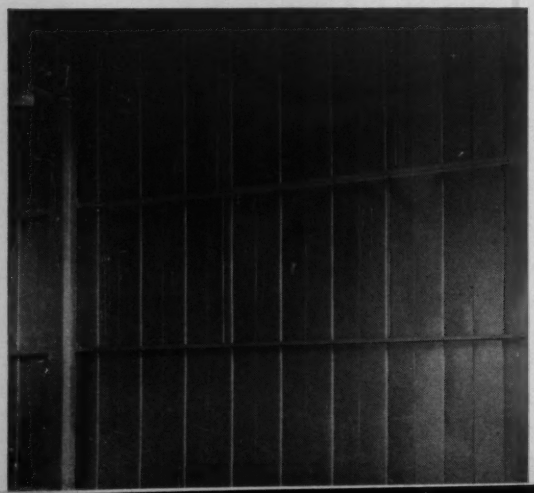
Miscellaneous

Block tin ..... 75 —77
No. 1 pewter ..... 57.50—58
Auto babbitt ..... 43 —44
Mixed common babbitt ..... 10¼—10¾
Solder joints ..... 14½—15
Siphon tops 41
Small foundry type ..... 9¾—10¼
Monotype ..... 9¾—10¼
Lino. and stereotype ..... 8¾— 9
Electrotype ..... 7½— 7¾
Hand picked type shells ..... 5¼— 5¾
Lino. and stereo. dross ..... 2¼— 2¾
Electro dross ..... 2¼— 2¾



NEW TRUSCON CURTAIN WALL PANELS INSULATED OR NON-INSULATED... LOW COST FOR COMMERCIAL AND INDUSTRIAL BUILDINGS

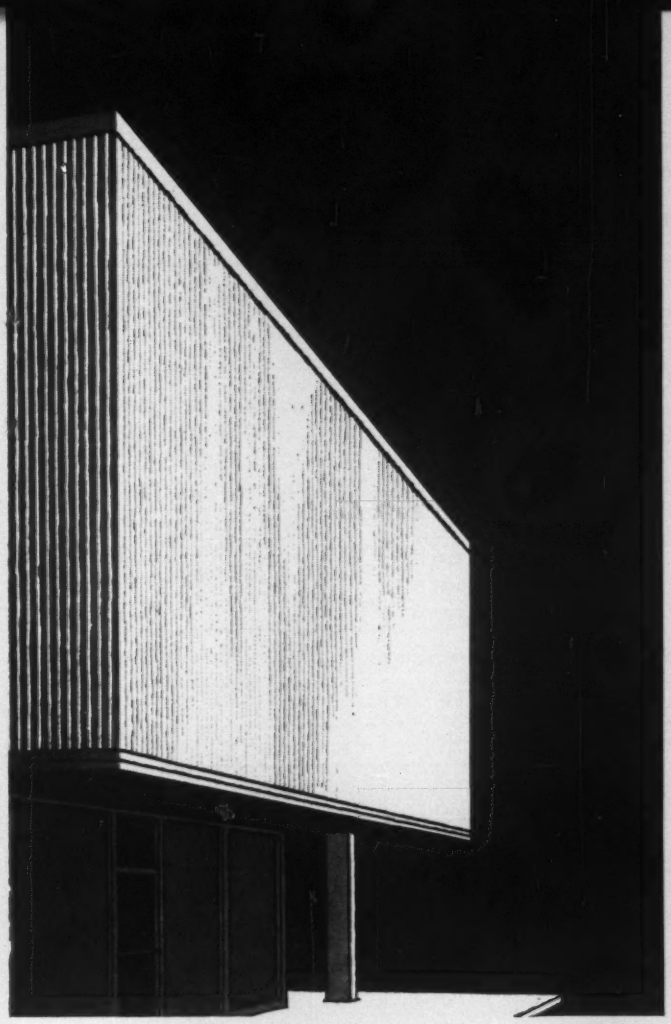
Notice the sharp, clean interior lines presented by Truscon 24″ FERROBORD and Insulated Wall Panels.



Truscon Curtain Wall Panels, insulated or non-insulated, are the answer to fast, economical commercial and industrial housing. Architecturally beautiful to blend with modern industrial park, commercial service and shopping centers.

Truscon Insulated Panels are constructed by sandwiching a layer of insulating material between two sheets of Truscon 24″ Ferrobord® or galvanized ribbed sheeting. Panels are securely interlocked and button-punched for maximum weather-tightness. Panels are furnished painted or galvanized, in widths of 2′-0″, and up to 40′-0″ in length.

Low installation cost, very little maintenance cost, and available for immediate delivery. Call your Truscon representative, or write direct for additional data.



LOW COST SHIPPING: Republic Coil Covers speed and simplify freight handling, protect cargoes in transit, stop vandalism. Designed for use on standard gondola and flat cars. Approximately 22 feet long, 6 feet wide, 6 feet high. Two covers are furnished for each car. Heavy-duty construction, easy to handle by overhead or track-side cranes. Six specially designed stacking brackets permit easy tiering. Call your Republic representative, or send coupon.

FAST, STRONGER, SAFE, LOW COST FRAMING: Republic METAL LUMBER solves framing problems fast. Simply measure, cut, assemble, with bolt and nut fasteners. Slotted angle pattern provides greater flexibility. Ideal for custom-built storage bins, storage racks, work benches, cat-walks. Available in two gages, two widths, in standard bundles of 10- or 12-foot lengths, complete with self-locking bolts and nuts. Order from your Republic-Berger warehouse or write direct for attractive brochure and data.

LOW COST WASH AND CHANGE FACILITIES: Republic Steel Lockers are designed and built for maximum efficiency and economy. Strong, sturdy, steel construction for easy installation, long life, low maintenance. Full inside locker roominess, ventilation, safety. Bonderized. Available in many sizes, colors, and locking systems. And, Republic offers complete locker planning and installation service. Write for complete information.

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World's Widest Range of Standard Steels and Steel Products

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Please send more information on the following products:

- ☐ Truscon Insulated Curtain Wall Panels
- ☐ Republic Steel Coil Covers ☐ Republic Steel Lockers
- ☐ Republic METAL LUMBER®

Name_____ Title_____

Firm_____

Address_____

City_____ Zone____ State_____

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES, STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1, P11, B9*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh Midland Butler Aliquippa N. Castle McKeesport Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3, B4, M10* 7.525 *E3*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*	$140.00 *B2*		6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, City, Ala. Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras.

(Effective Dec. 19, 1960)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Thin *0.25* lb. coating in coils
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price. 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		Prices are for .50 lb. base box for .45 lb. deduct 15¢; for .55 lb. add 15¢; for .60 lb. add 30¢.
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	$6.35 *U1*
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*	6.775 *B3*		7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	6.25 *B3*
	Worcester, Mass.									6.70 *A5*			
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	$6.25 *U1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1*†† *R3*	7.525 *R3, S1*	9.275 *R3*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	$6.25 *U1*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*		6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.50 *T2*	$9.20 *T2*	$6.35 *T2*
	Houston, Texas									6.65 *S2*			

Hollowware Enameling
29 ga.—*7.85 U1* at Gary; Pittsburgh; *I3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; *7.95 G2* at Granite City.

* Electrogalvanized sheets. (Effective Dec. 19, 1960) †† 7.425 at Sharon; Niles is 7.225.

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *P2*		7.50 *P2*	7.95 *P2*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Steelton, Pa.		5.675 *B3*									
	Fairless, Pa.	5.825 *U1*	5.825 *U1*									
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7,A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,13*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*				7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Youngstown, Steubenville, O.	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1,W5, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.675 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*		7.825 *B2*		9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.25 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla.	5.925 *S2*	5.675 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Dec. 19, 1960) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
B9 Barry Universal Corp., Detroit, Mich.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.,
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore**	$.10	7.87	9.71	10.16	10.28	8.44	9.13	8.65	11.80	17.48	16.48	21.58	20.83
Birmingham**		8.46	10.20	10.69	9.45	8.41	8.47	8.26	13.14	16.76	16.76	.....	.....
Boston**	.10	9.84	10.68	11.87	12.26	9.72	10.26	9.87	13.45	17.79	16.79	23.89	21.14
Buffalo**	.15	8.80	9.95	11.40	11.15	8.80	9.30	8.90	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	8.72	10.35	10.30	10.89	8.56	9.06	8.70	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	8.89	10.41	10.35	11.21	8.94	9.62	9.02	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	8.72[1]	10.13	11.39	11.01	8.80	9.45	8.81	11.40	17.21	16.21	21.31	20.56
Denver**		10.90	12.53	13.27	13.07	10.74	11.24	10.88	12.97	.....	.....	.....	20.84
Detroit**	.15	8.98	10.61	10.65	11.26	8.93	9.62	9.01	11.16	17.38	16.38	21.48	20.73
Houston**		9.22	9.65	12.19[3]	10.78	8.95	8.86	8.63	13.10	17.50	16.55	21.55	20.85
Kansas City**	.15	9.59	11.42	10.95	11.76	9.43	9.93	9.57	11.77	17.17	15.87	21.87	21.12
Los Angeles**		9.50[1]	11.20	12.20	11.29	9.70	10.45	9.55	14.20	18.30	17.35	22.90	22.20
Memphis**	.15	9.13	10.50	.....	10.79	8.81	9.16	8.97	12.89	.....	.....	.....	.....
Milwaukee**	.15	8.86	10.49	10.44	11.03	8.70	9.28	8.84	11.04	17.24	16.24	21.24	20.59
New York	.10	9.46	10.23	11.45	11.56	9.61	10.30	9.84	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia**	.10	8.45	9.70	10.76	10.45	8.80	9.05	8.85	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	8.72	10.13	11.28	10.99	8.56	9.06	8.70	11.40	17.10	16.10	21.20	20.45
Portland**		9.45	11.30	12.35	11.45	9.60	10.05	9.45	16.65	18.60	17.80	22.70	22.20
San Francisco**	.10	10.27	11.79[2]	11.50	11.88	10.48	10.59	10.17	15.20	18.30	17.35	22.90	22.20
Seattle**		10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.20	18.60	17.80	22.70	22.20
Spokane**	.15	10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.35	17.75	17.95	21.58	22.35
St. Louis**	.15	8.92	10.73	10.68	11.09	8.77	9.29	8.92	11.43	17.48	16.48	21.58	20.83
St. Paul**	.15	8.99	9.84	10.99	11.16	8.83	9.33	8.97	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅛" to 2⅜"; cold drawn—15/16" to 2⅜" round; Hot-rolled 4140—⅝" to 2⅜" round, cold drawn—15/16" to 2⅜" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Dec. 19, 1960)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	66.50	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.50	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	73.00
Lyles, Tenn. *T3*	.....	.....	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	73.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4*, (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container) — Pct

Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container) — Pct

Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk.	50
Hot galvanized and zinc plated—packaged	43.75
Hot galvanized and zinc plated—bulk	50

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Add 7½ pct for nuts assembled to bolts)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46
Machine Screws—bulk		
¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 *lb*
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

TOOL STEEL

f.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Dec. 19, 1960)

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	28.25	26.00	29.50–32.75	32.00	29.50–34.50	47.50	38.00	46.50	—	19.25–21.50	—	19.75–21.75
Billets, forging	—	37.75	38.75	39.50	42.50	39.50	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25–31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Detroit, *M2*; Louisville, O., *R5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville Pa., *U2*; Detroit, *M2*; Detroit, *S1*; Canton, Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *R5*; Sharon, Pa., *S1*; Butler, Pa., *A7*, Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13*, (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1*, (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R5*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R5*; Gary, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Ambridge, Pa., *B7*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Newark, N. J. *D2*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*; Detroit, *R5*; Reading, Pa., *C2*; Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Ambridge, Pa., *B7*; Baltimore, *E1*; Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R5*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Ambridge, Pa., *B7*; Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., S. Chicago, *U1*; Owensboro, Ky., *G5*; Bridgeport, Conn., *N8*; Reading, Pa., *C2*.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Annld ¢/lb.	Merch. Wire Galv. ¢/lb.
	Col	Col	Col	Col	Col		
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...	...	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	...	...	...	...	...	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	...	...	...	...	...	9.00	9.55
Chicago *W7*	173	...	...	...	...	9.00	9.55†
Cleveland *A6*	...	...	...	...	...	...	.....
Cleveland *A5*	...	...	...	...	...	9.00	.....
Crawf'dav. *M4***	175	193	...	214	199	9.10	9.85
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	...	...	...	...	...	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	...	...	...	...	...	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass. *W6*	...	...	...	...	...	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.95	10.50
Rankin Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	...	...	...	236	...	9.95	10.50
Sparrows Pt. *B3***	175	...	...	215	198	9.10	9.775
Struthers, O. *Y1**	...	...	...	...	...	8.65	9.20
Worcester *A5*	179	...	...	...	...	9.30	9.85
Williamsport *S5*	...	...	...	...	...	...	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

STANDARD T. & C.	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 12.50¢ per lb.

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.6
Chicago	140.0
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

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FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 65-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	33.25
0.05% C....	34.00	1.00% C....	33.00
0.10% C....	33.75	1.50% C....	32.75
0.20% C....	33.50	2.00% C....	32.50

3-5% C, 53-63% Cr, 2.5% max. Si... 26.00
4-6% C, 58-63% Cr, 3-6% Si..... 22.50
5-8% C, 58-63% Cr, 3-6% Si..... 22.50
6-8% C, 50-56% Cr, 4-7% Si..... 22.00
4.00-4.50% C, 60-70% Cr, 1.2% Si.. 28.75
0.025% C (Simplex) 35.00
0.010% C max, 63-66% Cr, 5-7% Si. 34.50
0.25% C max 33.50
0.010% C max, 68-71% Cr, 2% Si max 34.50
0.25% C max 33.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed delivered, ton lots, 97.25% min. Cr, 1% max. Fe.
0.10% max. C $1.29
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.
Carloads $1.15
Ton lots 1.17
Less ton lots 1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in x down, packed.
Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	24.50	14.60
Ton lots	29.75	16.05
Less ton lots	31.35	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.
Carloads, bulk 24.00
Ton lots 27.95
Less ton lots 29.45

Calcium-Maganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads, bulk 23.00
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.
Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.
Carload lots 18.45
Ton lots 19.95
Less ton lots 21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
Carload bulk 19.20
Ton lots to carload packed 21.15
Less ton lots 22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	11.00
Houston, Tex.	11.00
Johnstown, Pa.	11.00
Lynchburg, Va.	11.00
Neville Island, Pa.	11.00
Sheridan, Pa.	11.00
Philo, Ohio	11.00
Rockwood, Tenn.	11.00
S. Duquesne	11.00

Add or substract 0.1¢ for each 1 pct Mn above or below base content.
Briquets, delivered, 66 pct Mn:
Carloads, bulk 13.70
Ton lots packed in bags 16.10

Spiegeleisen

Per gross ton, lump, f.o.b., 3% Si max.

Mn	Palmerton, Pa. 10 lb, pig	35 lb, down	Neville Is., Pa. 35 lb
16-19% ..	$98.00	$96.00	$100.50
19-21% ..	100.00	98.00	102.50
21-23% ..	102.50	100.00	105.50

Manganese Metal

2 in. x down, cents per pound of metal delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.
Carloads, bulk 34.25
Ton lots, palletized 36.25
250 to 1999 lb 39.00
Premium for Hydrogen - removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 24.00

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% (Bulk) P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	31.10	33.90	35.10
0.30% max. C	29.80	32.60	33.80
0.50% max. C	28.50	31.30	32.50
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	27.00	29.80	31.00

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.3¢ f.o.b. shipping point.
Carloads bulk 11.60
Ton lots, packed 13.25
Carloads, bulk, delivered, per lb of briquet 14.00
Briquets, packed pallets, 2000 lb up to carloads 16.40

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, frieght allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe ..	22.95	21.65
98% Si, 1.0% Fe	21.95	20.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.
Carloads, bulk 8.00
Ton lots, packed 10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.60	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
	90% Si....	20.00	

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.
Openhearth 3.20
Crucible 3.30
High speed steel 3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb...	2.40	3.30	4.55

(Effective Dec. 19, 1960)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y. per lb.
Carloads, bulk ..... 9.85¢
Ton lots ..... 11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.50

Ferrocolumbium, 58-62% Cb, 2 in. x D, del'd per lb con't Cb
Ton lots $3.45
Less ton lots 3.50

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.76

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $255.00

Ferrotungsten, ¼ x down packed per pounds contained W, ton lots delivered ..... $2.15 (nominal)

Molybdic oxide, briquets per lb. contained Mo, f.o.b. Langeloth, Pa. $1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.
Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk.. 26.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound ..... 30¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 18.25¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots... $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb & over
No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots (packed) $1.46
Less ton lots (packed) 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

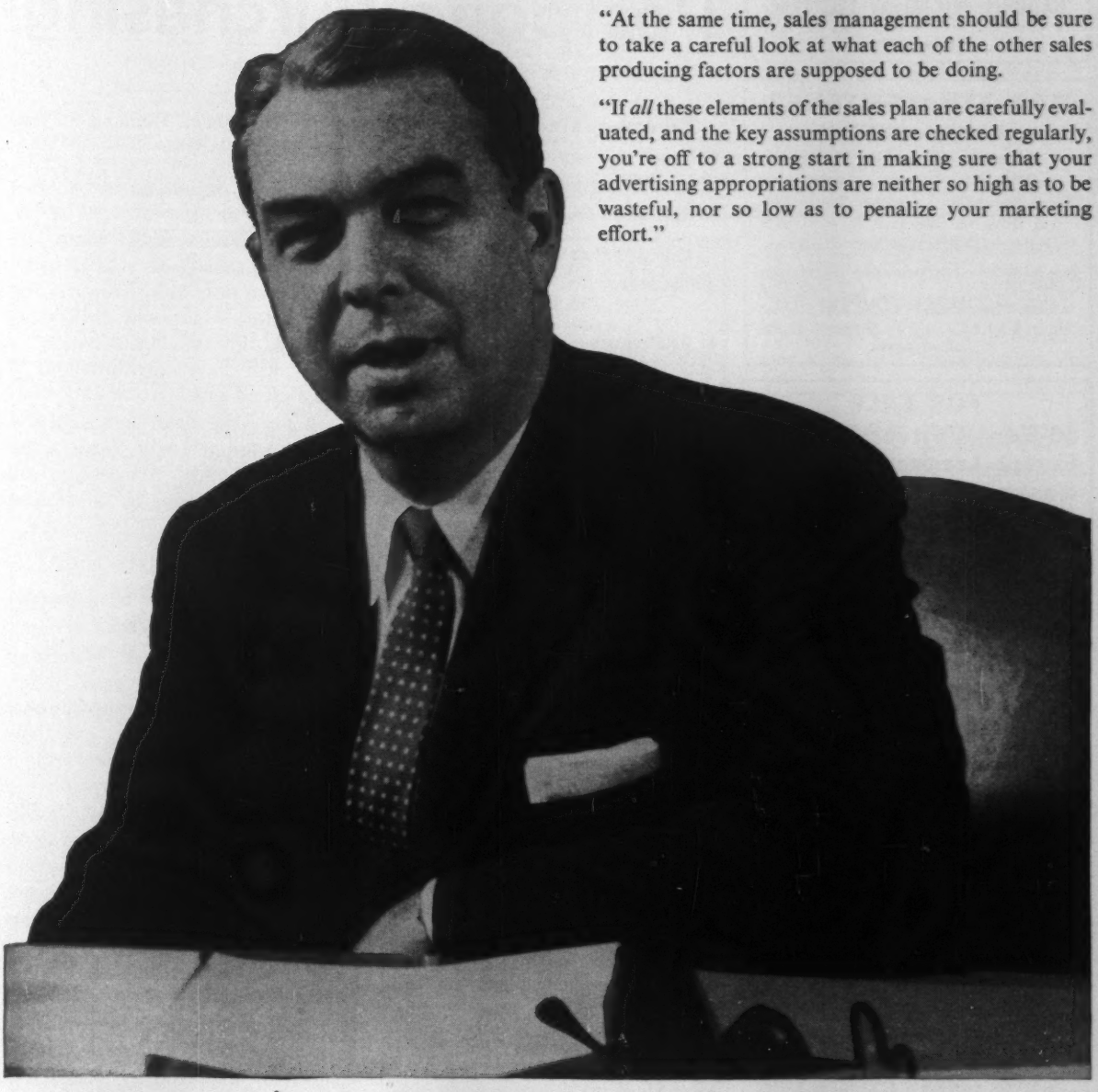
"How much is enough for advertising?"

JOHN R. SARGENT, partner in the nationally-known management consultant firm of Cresap, McCormick and Paget, points the way toward solution of one of top management's knottiest problems.

"Good sales management generally knows the crucial sales problems faced by each one of its products. Through good advertising advice plus experience, trial and error, and some judicious advertising testing, sales management also can come to have a good understanding of what advertising can and cannot do.

"At the same time, sales management should be sure to take a careful look at what each of the other sales producing factors are supposed to be doing.

"If *all* these elements of the sales plan are carefully evaluated, and the key assumptions are checked regularly, you're off to a strong start in making sure that your advertising appropriations are neither so high as to be wasteful, nor so low as to penalize your marketing effort."



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3 LEE WILSON RECTANGULAR
BELL-TYPE ANNEALING FURNACES
atmosphere-controlled with 9 bases, are available. Each is approximately 7' x 7' x 14'. Excellent when used for manufacture of steel coils, they have a capacity of 50 tons per charge. These top-grade furnaces are still set up in the plant. Tremendous values specially priced for prompt sale.
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CAnal 6-2470

BAR STRAIGHTENER
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Capacity 5/8" to 3 1/2" Solids
Mfd. 1943 30 to 150 FPM.
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Direct Drive to Gearcase 75 H.P. M.D.
Weight 41,000# Excellent Condition
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3 PHASE 60 CYCLE
Quan. Size Description
2—3000 HP DC MOTORS—525 V. 600 RPM Whse. M.G. Sets—2500 K.W. Whse., 2300/4160 V.
1—2750 HP DC MOTOR 450 V. 300 RPM Elliott 2200 K.W., Gen. Elec. 3 unit 450 V. DC Gen. with 3000 HP 720 RPM, 2300 V. AC Motor and Etc.
1—2250 HP DC MOTOR 600 V. 400/500 RPM, G.E. M.G. Set—2000 K.W. G.E. AC Motor—2300 V.
1—1500 HP DC MOTOR 600 V. 600 RPM Whse. M. G. Set. 1500 K.W. G.E. 13,200 V.
1—1500 HP DC MOTOR 600 V. 300/700 RPM Whse. M.G. Set—1500 K.W. G.E. 13,200 V.
For listing of Motors, Generators, Transformers, M.G. Sets, Rectifiers, Mill Motors, etc.
See last week issue.
Write — Phone — Wire
BELYEA COMPANY, Inc.
47 Howell St., Jersey City, N. J.
Tel. Oldfield 3-3334

Pittsburgh Buyers Postpone Purchasing

Used machinery dealers in Pittsburgh say customers are now waiting until after the first of the year to buy.

The general market tone is a bit firmer.

■ The closing weeks of the year find Pittsburgh used machinery customers pushing back the few buying plans they had.

Some dealers feel there is a little better tone to the market and a little more optimism and activity; but it seems clear that actual orders won't move up until the first half of 1961.

Also, current interest is marked by bargain hunting to a large extent. The supply of equipment is generally good and even late models are starting to come on the market in greater numbers. Dealers say there is a buyers market but prices have not reached distress levels. Apparently some customers are looking for this kind of pricing.

Depressed Levels—For one supplier of general machinery, orders and inquiries are holding at depressed levels. There is a little more talk of equipment plans but little prospect of action until the first half.

The business slump is starting to show up in the supply of equipment. Large shears and engine lathes are among the items that have been turned loose by plants. However, these are so new that prices are high. And customers are looking for low prices.

Buying interest centers on fabricating equipment. Demand for machine tools is very slow.

Signs of Improvement—Another machinery dealer sees signs of improvement but admits these are intangible. There is a little better attitude, a little more cheer. A few orders for slitters and brakes are coming through. Occasionally a plant will have appropriations it must spend quickly.

But for the most part, action is being deferred . . . "there is no hurry about this," a customer will say. "We're figuring on it for next year."

Argentina Eases Used Tool Duties

According to Chase Manhattan Bank, Argentina has eased duties on used machinery coming into that country. Used machines may now be imported without surcharge if they meet certain requirements.

Models must be in good condition. They must be similar to those now being produced by the manufacturer. This requirement does not rule out older machines. If designs have not changed radically since a unit was built, it may be brought into Argentina without surcharge.

This move could point to a middle ground for Latin America in its effort to build industry. Restrictive tariffs have been applied by several nations in order to protect and encourage local industry. Yet many of these nations do not have markets that justify large investments in new equipment. Used machinery might be a logical answer in many cases.

RAILWAY EQUIPMENT

USED and RECONDITIONED
RAILWAY CARS and REPAIR PARTS

DIESEL-ELECTRIC LOCOMOTIVES
Various Sizes.
* * * * * *
CRANE, Burro—5½-Ton
* * * * * *
Specifications & Prices Upon Request

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Box—Flat—Hopper
Excellent Condition—Ready for Service

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51-B E. 42nd St. New York 17, N.Y. Ph. YUkon 6-4766

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1—35" 2-HIGH BLOOMING MILL, with reversing motor, M.G. set, tables, manipulator.
1—3-HIGH PLATE MILL 40" & 26½" x 112".
1—34" & 22" x 112" PLATE MILL, 3-high.
1—32" & 20" x 56" 3-HIGH SHEET MILL with motor driven screwdown and pre-set controls.
1—25" & 42" x 84" HOT STRIP MILL, 4-high.
4—29" 2'-HIGH HOT SHEET MILLS.
1—18" x 29" COLD MILL, 2-high, 200 HP drive.
1—26" COLD SHEET MILL TRAIN, 8 stands, 400 HP motor and drive.
1—18" x 24" STRIP MILL, 2-high, forged rolls.
1—9½" & 8½" x 5½" STRIP MILL, 4-high.
1—10" BAR MILL, 3-high, single stand.
1—9" BAR MILL, 3-high, five stands.
1—34" x 192" ROLL GRINDER.
1—450 TON DOWN-CUT CROP SHEAR, 14" stroke, length of knives 28".
1—VERTICAL OPEN-SIDE BAR SHEAR, 28" knife, capacity 1" x 24" or equal.
1—HYDRAULIC DIVIDING SHEAR, capacity 8" x 5¼" hot steel.
1—SHEAR, 1" x 110" plate.
2—SQUARING SHEARS for ¼" x 138" sheets.
2—SQUARING SHEARS for 10 ga. x 120" sheets.
1—ROLLER LEVELLER, 1" x 144" plate.
4—LEVELLERS for sheets, 17 rolls, widths 48", 54", 60", 72".
1—AUTOMATIC SQUARING SHEAR UNIT for sheets, 132" side cut, 72" end cut.
1—ROLL LATHE, ENCLOSED HEADSTOCK, up to 40" dia. rolls.
1—BILLETEER, size C, for conditioning billets from 3" to 12" square, up to 19' lengths.
1—SLITTER FOR SHEETS up to 144" wide.
1—CORRUGATING MACHINE for sheets 144" long, 3 sets of removable dies.
1—HALLDEN STRAIGHTENING AND CUTTING-OFF MACHINE, capacity 5/16" to ¾" dia. x 14 ft.
1—POINTER, tube 2" O.D. x ¼" wall maximum.
1—1500 HP GEAR DRIVE, ratio 8 to 1.
1—1200 HP GEAR DRIVE, 295 to 30 RPM.
1—1200 HP GEAR DRIVE, 353 to 94.5 RPM.
1—800 HP GEAR DRIVE, 1.086 to 1 ratio.
1—400 HP GEAR DRIVE, 8.2 to 1 ratio.
1—1500 HP MOTOR, 2300 volts, 3 phase, 60 cycle, 240 RPM.
1—600 HP MOTOR, 2300/4600 volts, 3 phase, 60 cycle, 450 RPM.
1—400 HP MOTOR, 440 volts, 3 phase, 60 cycle, 450 RPM.
1—400 HP MOTOR, 2300/4600 volts, 3 phase, 60 cycle, 450 RPM.
1—400 HP MOTOR, 2200 volts, 3 phase, 60 cycle, 386 RPM.

FRANK B. FOSTER, INC.
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Cable "Foster, Pittsburgh" Telephone Atlantic 1-2780

MACHINES FOR YOUR YARD

Austin 8 ton roller
Adams Tandem Grader
American car puller
Vermeer ditcher 524-T
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Ford tractor w/Arps trencher

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Chicago Phone HI-lltop 5-8800

6' x 10 Ga. Whitney Power Shear.
No. 3 Niagara Angle Bending Roll, M.D.
6" x 6" x 1" Cleveland Double Angle Shear.
6' x ⅜" Cincinnati Power Press Brake.
No. ½, No. 1½ Buffalo Univ. Ironworkers, M.D.
600 Ton Southwark Hyd. Inclined Wheel Press.
6' x ¼" Lawn Initial Bending Roll, M.D.

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Experimental or subcontract; twist or gun drill

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BLAST FURNACE Rebuilt 1958
108 COKE OVENS New 1950
6 TON ELEC. BRIDGE 231' Span 80' Cantilever
COAL CRUSHING & MIXING PLANT
COAL & COKE HANDLING PLANT
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Send for Our Illustrated Stock & Price List

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750 Ton to 1300 Ton National "Maxipres" Forging Presses, 80 SPM, Air clutch, top & bottom knock-outs, mfg. 1955.
920 Ton Bliss-Tol. #60, bed 47" x 72", str. 20", 75 HP, air clutch, mfg. 1943.
440 Ton Bliss-Tol. #59¼, bed 41" x 48", str. 12", air clutch, air cushion.
380 Ton Bliss 4-FE-380-168 press, bed 170" x 65", air clutch & cush. 10" str., 18 SPM, mfg. 1945.
3000# Chambersburg #30CD "Ceco Drop" Hammer '51.

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WENDER PRESSES INC.
1957C CLAY, DETROIT 11, MICHIGAN

FOR SALE: 8 Overhead Cranes, 40' to 60' span, 5 to 30 ton capacity.
15 Furnace Transformers, 12000V/100V or less, 25 cy. built in 1942.
1 FEEDOWEIGHT, made by Merritt Scale Co.
4 Steel Buildings
65 acres of land with 7 miles of track.

Write to: NORTH AMERICAN WASTE, INC.
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HORIZONTAL DRILLS
2 spindle No. 410 W. F. & John Barnes, m.d.
No. 410 W. F. & John Barnes, horizontal boring & Drilling Machine, m.d.
No. 410 Barnes Single Spindle Deep Hole, m.d.
No. 2 Avey S type MA 1, with horizontal operation
No. ½8x50" Pratt & Whitney Gun Barrel Rifling, Model M1821, m.d., latest
No. 1½x61" Pratt & Whitney 2 spindle deep hole drill
No. 1½"x105" Pratt & Whitney, 2 spindle Hydraulic Deep Hole Drill, model 973, m.d., latest
No. 1½"x105" Pratt & Whitney, model M1825, 2 spindle Gun Barrel Rifling, m.d.
¾" Bausch Double Horizontal Drilling Machine, m.d.
No. 420 Barnes 2 spindle Deep Hole Drill and Boring Machine
No. 445 W. F. & John Barnes Independent 2 spindle Deep Holl Drill & boring machine, late
No. 2F1 Natco Horizontal Boring & Drilling Machine
Natco, Holesteel Model, m.d.
Natco Horizontal Drill, 2 opposed B4F2 head, 1943
No. 2 LeBlond Deep Hole Borer, m.d., 1943

MULTIPLE SPINDLE DRILLS
Model #E5 Natco Multiple Spindle H.S. Drill Press
2 spindle No. 201¼ Barnes, m.d., H.D.
2 spindle No. 6 Colburn Mfg. Type H.D., separate m.d. to each spindle
4 spindle No. 201¼ Barnes H.D., m.d.
6 spindle Barnes, m.d.
6 spindle W. F. & John Barnes Vertical Drilling Machine, m.d.
No. 924 Barnes Vertical Boring, Drilling, Facing & Reaming Machine

UPRIGHT DRILLS
Model H4 Barnes Hydram, m.d.
20" Barnes, m.d., 1940
20" Barnes All Geared Self-Oiling Drill & Taper, m.d.
21" Cincinnati-Bickford, single spindle, m.d.
21" Cincinati-Bickford, H.D., m.d., late
28" Cincinati-Bickford, H.D.
No. 2 AL Natco Holesteel Vertical, m.d.
No. 201¼ Barnes Single Spindle Upright Drill & Taper, m.d.
No. 314A Baker Universal Quick Change Type, m.d. H.S.
No. 513 Baker, m.d., belted m.d.

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6x20" Fitchburg Hydraulic Spline & Gear, m.d.
GG19 Gear Grinding, m.d., latest
GG31 Gear Grinding, Internal Geared & Spline Grinder, m.d.
15" National Broach Red Ring Gear Lapper, m.d.
18" National Broach Red Ring Gear Lapper, m.d.
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EQUIPMENT AND MATERIALS WANTED

WANTED
BRIDGE CRANES
ARNOLD HUGHES COMPANY
2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

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NEW *WANTED* USED
Structurals, Plate, Pipe and Tubing
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WANTED
(1) 14" AND (1) 24" DIA. ROLL LATHES COMPLETE WITH NECK AND PIANO RESTS AND TOPPING ATTACHMENTS.
ADVISE PRICE, DELIVERY, LOCATION, AND CONDITION, ETC.
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WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
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39 Years of Steel Service

WANTED TO PURCHASE—any quantity
CARBON—ALLOY—STAINLESS
Bars—Billets—Sheet—Plate
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EDgewood 3-7300

WANTED
SURPLUS STEEL
WALLACK BROTHERS
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GROVEHILL 6-7474

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Merchant or Bar Mill experience required. Age 35 to 55. All replies strictly confidential. Submit resume of experience to
BOX H-128
c/o The IRON AGE, Chestnut at 56th, Phila. 39

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Previous experience required in all phases of Roll and Guide design for continuous mills. Send detailed resume and salary expected to
BOX H-129
c/o The IRON AGE, Chestnut at 56th, Phila. 39

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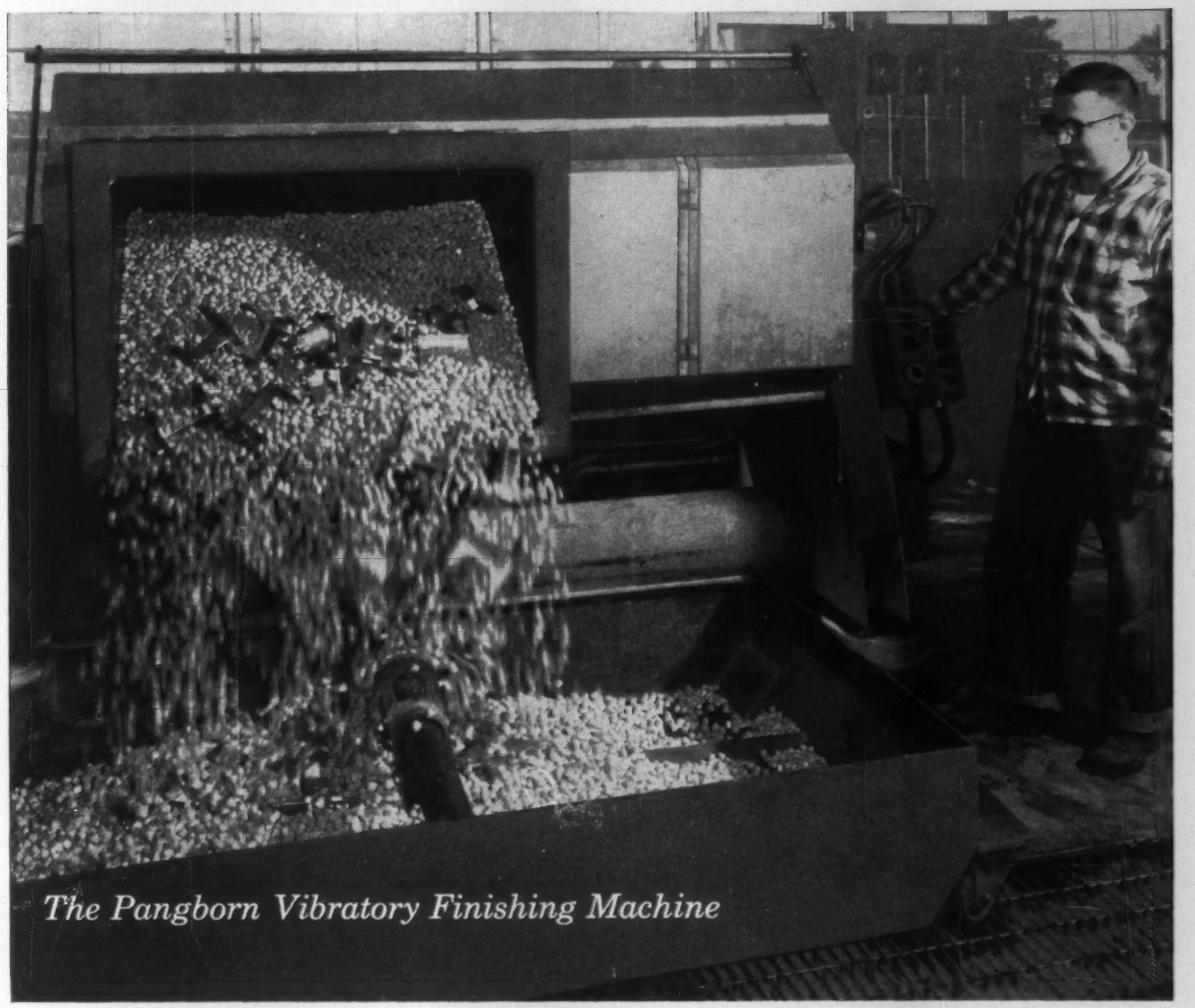

The Pangborn Vibratory Finishing Machine

THE LONGER YOU OWN IT, THE MORE USEFUL IT IS!

"Every day we find new pieces it can finish," comes the word from the large, Midwestern die-casting firm shown above. And no wonder!

This machine makes itself useful in many ways: cleaning, descaling, radiusing, fine-finishing, burnishing or coloring. It can do all this with metals, alloys, many types of plastic and ceramic parts . . . and at speeds up to 100 times faster than conventional methods. It cleans the intricate or shielded surfaces you can't reach with barrel finishing or other means.

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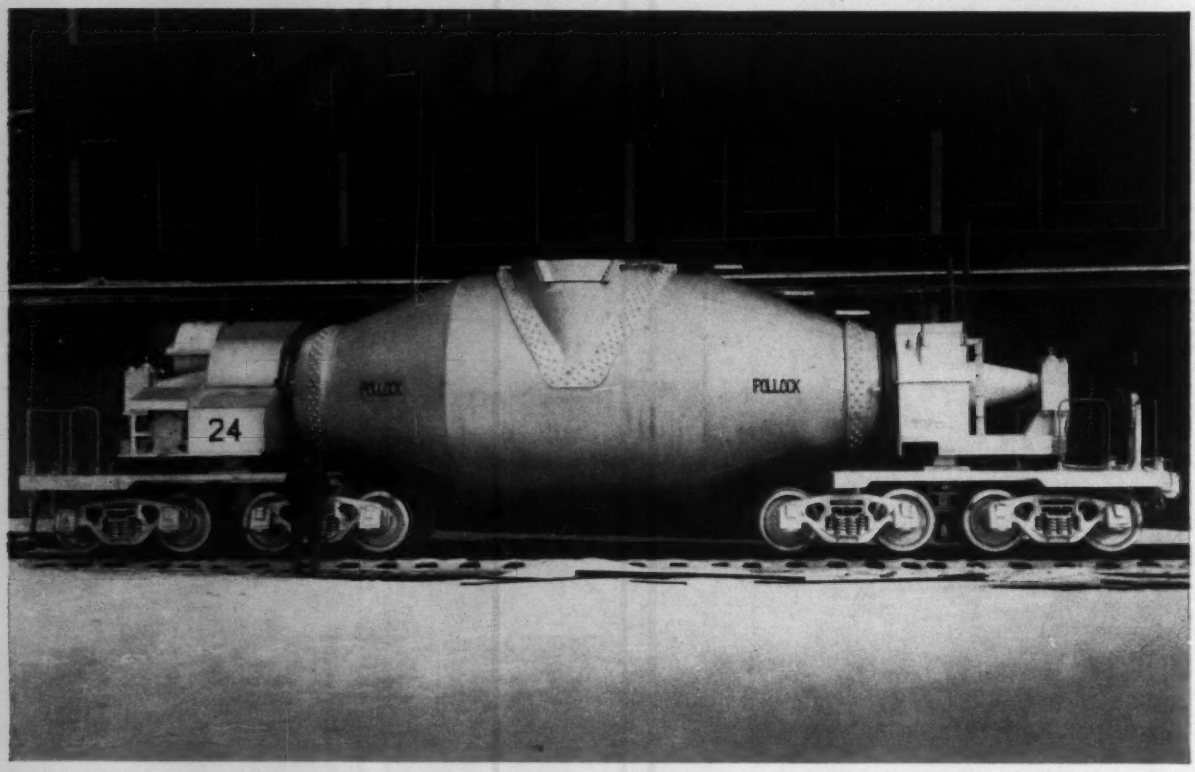
Send parts with exact finish specifications or finished specimen, for sample processing in our laboratory to: Mr. William E. Brandt, PANGBORN CORPORATION, 1500 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Dust Control, Blast Cleaning and Vibratory Finishing Equipment—Rotoblast® Steel Shot and Grit.®*

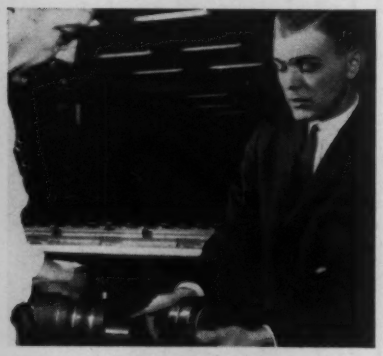
Pangborn

OF HAGERSTOWN

Hot car rolls on cool bearings—

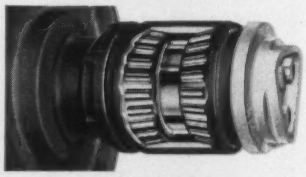


Weighing a whopping total of 360 tons, this car transports 200 tons of hot metal from blast furnace to refining unit. To be sure of cool running wheel bearings to make the car roll easier, take the terrific loads and shock impact, the car manufacturer—The William B. Pollock Co.—specified Timken® heavy duty "All Purpose" tapered roller bearings, the type used on more and more of America's freight cars. Because Timken bearings *roll* the load they practically eliminate friction. Cars start and roll easier, saving power. And because of their tapered design Timken bearings take *both* radial and thrust loads. No auxiliary thrust collars are needed. Timken "AP" bearings come pre-assembled, pre-lubricated, ready to install. They will go 4 years without adding lubricant. Maintenance is reduced, car availability increased. What's more, they cut locomotive wheel spinning, decrease wheel wear, eliminate flat spots on rails and increase rail life.



YOUR SAVINGS MOUNT when you use the services of our graduate engineer salesmen. They'll work with you at the design stage, can often solve your bearing problems *on the spot.*

GREATER BEARING ACCURACY is assured through super-sensitive gages in our master gage laboratory, one of industry's finest. Some instruments measure even the thickness of a molecule.



Industry rolls on

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